

Service
Service
Service190C1SB/00
190C1SB/93

Service Manual

Horizontal frequencies
30 - 83 kHz

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SAFETY NOTICE

ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOL TAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING.

REFER TO BACK COVER FOR IMPORTANT SAFETY GUIDELINES

Important Safety Notice

Proper service and repair is important to the safe, reliable operation of all Philips Consumer Electronics Company equipment. The service procedures recommended by Philips and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It is also important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Philips could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Philips has not undertaken any such broad evaluation. Accordingly, who uses a service procedure or tool which is not recommended by Philips must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

** Hereafter throughout this manual, Philips Consumer Electronics Company will be referred to as Philips. **

WARNING

Critical components having special safety characteristics are identified with a by the Ref. No. in the parts list and enclosed within a broken line

(where several critical components are grouped in one area) along with the safety symbol on the schematics or exploded views.

Use of substitute replacement parts which do not have the same specified safety characteristics may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from Philips. Philips assumes no liability, express or implied, arising out of any unauthorized modification of design.

Service assumes all liability.

FOR PRODUCTS CONTAINING LASER :

- DANGER - Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.
- CAUTION - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
- CAUTION - The use of optical instruments with this product will increase eye hazard.

TO ENSURE THE CONTINUED RELIABILITY OF THIS PRODUCT, USE ONLY ORIGINAL MANUFACTURER'S REPLACEMENT PARTS, WHICH ARE LISTED WITH THEIR PART NUMBERS IN THE PARTS LIST SECTION OF THIS SERVICE MANUAL.

Take care during handling the LCD module with backlight unit

- Must mount the module using mounting holes arranged in four corners.
- Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.
- Do not scratch or press on the panel with any sharp objects, such as pencil or pen as this may result in damage to the panel.
- Protect the module from the ESD as it may damage the electronic circuit (C-MOS).
- Make certain that treatment body are grounded through wrist band.
- Do not leave the module in high temperature and in areas of high humidity for a long time.
- Avoid contact with water as it may as short circuit within the module.
- If the surface of panel become dirty, please wipe it off with a soft material. (Cleaning with a dirty or rough cloth may damage the panel.)

Technical Data

SEC panel

Type NR.	: LTM190BT03
Resolution	: 1400x900 (WXGA+)
Outside dimensions	: 428 (H) x 278(V) x 17.5(D) mm (Typ.)
Pitch (mm)	: 0.2835mm x 0.2835mm
Color pixel arrangement	: 14400 horiz. By 900 vert. Pixels RGB strip arrangement
Display surface	: Hard coating(3H) & Anti-glare treatment of the front polarizer
Color depth	: 16.7M colors
Backlight	: 2 CCFL
Active area (W x H)	: 408.24mm x 255.15mm
View angle (CR>10)	: >=160/160 for H/V (Typ)
Contrast ratio	: >=1000:1 (Typ)
White luminance	: >=300 nit (Typ)
Color gamut	: >=72%
Source IC	: LDI, NEC
Response time	: <=5 ms (Typ)
Vertical frequency range	: 56~76Hz

Scanning frequencies

Hor.	: 30 – 83 K Hz
Ver.	: 56 - 76 Hz
Video dot rate	: < 137 MHz
Power input	: 90-264 V AC, 50/60 ± 2 Hz
Power consumption:	< 36 W (Typ.) < 42 W (Max.)

Functions:

- (1) D-SUB analog R/G/B separate inputs, H/V sync separated, Composite (H+V) TTL level, SOG sync
- (2) DVI digital Panel Link TMDS inputs

Ambient temperature: 0 °C - 40 °C

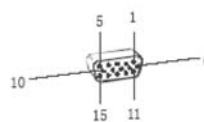
Power input connection

Power cord length	: 1.8 M
Power cord type	: 3 leads power cord with protective earth plug.

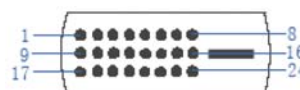
Power management

The monitor must comply with the Microsoft On Now specification, and meet EPA requirements.

Mode	HSYNC	VSYNC	Video	Pwr-cons.	Indication	Rec. time
Power-On	On	On	active	< 36 W typ. < 42 W max.	White LED	--
Stand by	Off	Off	blanked	< 0.8 W	Blinking White LED Period: 3sec On, 3sec Off	< 3 s
DC Power Off			N/A	< 0.5 W	LED Off	



PIN No.	SIGNAL	PIN No.	SIGNAL
1	Red	9	DDC +3.3V or +5V
2	Green/ SOG	10	Logic GND
3	Blue	11	Sense (GND)
4	Sense (GND)	12	Bi-directional data
5	Cable Detect (GND)	13	H/H+V sync
6	Red GND	14	V-sync
7	Green GND	15	Data clock
8	Blue GND		



Pin No.	Description
1	T.M.D.S. data2-
2	T.M.D.S. data2+
3	T.M.D.S. data2 shield
4	No Connect
5	No Connect
6	DDC clock
7	DDC data
8	No Connect
9	T.M.D.S. data1-
10	T.M.D.S. data1+
11	T.M.D.S. data1 shield
12	No Connect
13	No Connect
14	+5V Power
15	Ground (for +5V)
16	Hot plug detect
17	T.M.D.S. data0-
18	T.M.D.S. data0+
19	T.M.D.S. data0 shield
20	No Connect
21	No Connect
22	T.M.D.S. clock shield
23	T.M.D.S. clock+
24	T.M.D.S. clock-

Susceptibility of display to external environment

Operating

- Temperature : 0 to 40 degree C
- Humidity : 80% max
- Altitude : 0-3658m
- Air pressure : 600-1100 mBAR Storage

Storage

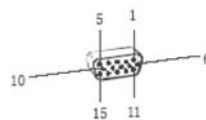
- Temperature : -20 to 60 degree C
- Humidity : 95% max
- Altitude : 0-12192m
- Air pressure : 300-1100 mBAR

Note: recommend at 5 to 35°C, Humidity less than 60 %

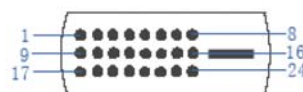
Technical Data

LGD panel

Type NR.	: LM190WX1-TLL1
Resolution	: 1440x900 (WXGA+)
Outside dimensions	: 428.0 (H) x 278.0 (V) x 14.5 (D) mm (Typ)
Pitch (mm)	: 0.2835(H) x 0.2835(V)
Color pixel arrangement	: RGB vertical stripe
Display surface	: Anti-glare type, Hardness 3H
Color depth	: 16.7M colors
Backlight	: 2 CCFL
Active area (W x H)	: 408.24mm x 255.15mm
View angle (CR>10)	: >=170/160 for H/V (Typ)
Contrast ratio	: >=1000:1 (Typ)
White luminance	: >=250 nit (Typ)
Color gamut	: >=72%
Gate IC	:
Source IC	:
Response time	: <=5 ms (Typ)
Vertical frequency range	: 56~76Hz



PIN No.	SIGNAL	PIN No.	SIGNAL
1	Red	9	DDC +3.3V or +5V
2	Green/ SOG	10	Logic GND
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7	Green GND	15	Data clock
8	Blue GND		



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Functions:

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- (2) DVI digital Panel Link TMDS inputs

Ambient temperature: 0 °C - 40 °C

Power input connection

Power cord length	: 1.8 M
Power cord type	: 3 leads power cord with protective earth plug.

Power management

The monitor must comply with the Microsoft On Now specification, and meet EPA requirements.

Mode	HSYNC	VSYNC	Video	Pwr-cons.	Indication	Rec. time
Power-On	On	On	active	< 36 W typ. < 42 W max.	White LED	--
Stand by	Off	Off	blanked	< 0.8 W	Blinking White LED Period: 3sec On, 3sec Off	< 3 s
DC Power Off			N/A	< 0.5 W	LED Off	

Pin No.	Description
1	T.M.D.S. data2-
2	T.M.D.S. data2+
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8	No Connect
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10	T.M.D.S. data1+
11	T.M.D.S. data1 shield
12	No Connect
13	No Connect
14	+5V Power
15	Ground (for +5V)
16	Hot plug detect
17	T.M.D.S. data0-
18	T.M.D.S. data0+
19	T.M.D.S. data0 shield
20	No Connect
21	No Connect
22	T.M.D.S. clock shield
23	T.M.D.S. clock+
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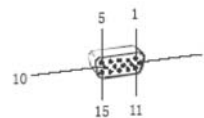
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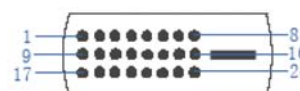
Technical Data

CMO panel

Type NR.	: M190A1-L0G
Resolution	: 1400x900 (WXGA+)
Outside dimensions	: 428 (H) x 278(V) x 16.2(D) mm (Typ.)
Pitch (mm)	: 0.2835mm x 0.2835mm
Color pixel arrangement	: 14400 horiz. By 900 vert. Pixels RGB strip arrangement
Display surface	: Hard coating(3H) & Anti-glare treatment of the front polarizer
Color depth	: 16.7M colors
Backlight	: 2 CCFL
Active area (W x H)	: 408.24mm x 255.15mm
View angle (CR>10)	: >=170/160 for H/V (Typ)
Contrast ratio	: >=1000:1 (Typ)
White luminance	: >=250 nit (Typ)
Color gamut	: >=72%
Gate IC	:
Source IC	:
Response time	: <=5 ms (Typ)
Vertical frequency range	: 56~76Hz



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5	No Connect
6	DDC clock
7	DDC data
8	No Connect
9	T.M.D.S. data1-
10	T.M.D.S. data1+
11	T.M.D.S. data1 shield
12	No Connect
13	No Connect
14	+5V Power
15	Ground (for +5V)
16	Hot plug detect
17	T.M.D.S. data0-
18	T.M.D.S. data0+
19	T.M.D.S. data0 shield
20	No Connect
21	No Connect
22	T.M.D.S. clock shield
23	T.M.D.S. clock+
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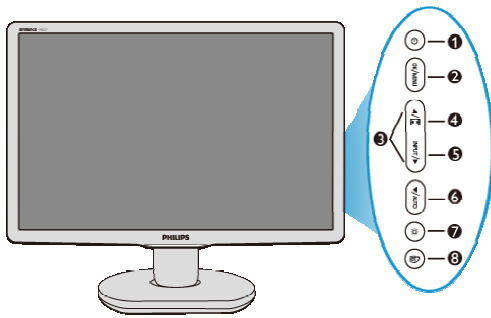
Storage

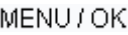
- Temperature : -20 to 60 degree C
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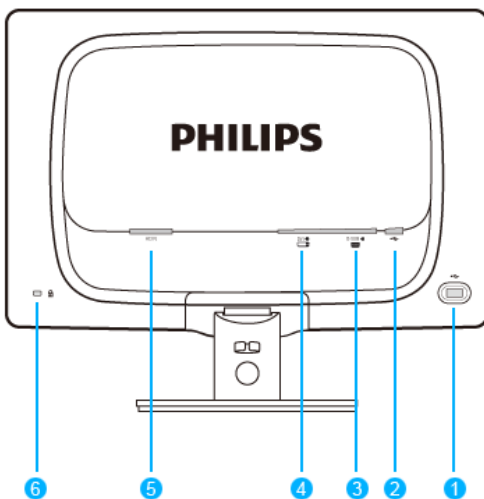
Installation

Front View Product Description



- 1  To switch monitor's power On and Off
- 2  To access the OSD menu
- 3  To adjust the OSD menu
- 4  Change to 4:3 display
- 5  To change the signal input source
- 6  Automatically adjust the horizontal position, vertical position, phase and clock settings / Return to previous OSD level
- 7  To adjust brightness of the display
- 8  SmartImage. There are five modes to be selected: Office Work, Image Viewing, Entertainment, Economy, and Off

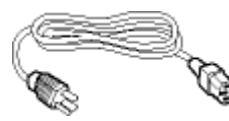
Rear View



- 1 USB downstream port
- 2 USB upstream port
- 3 VGA input
- 4 DVI-D input (available for selective models)
- 5 AC power input
- 6 Kensington anti-theft lock

Accessory Pack

Unpack all the parts



Power cord



DVI cable
(Optional)



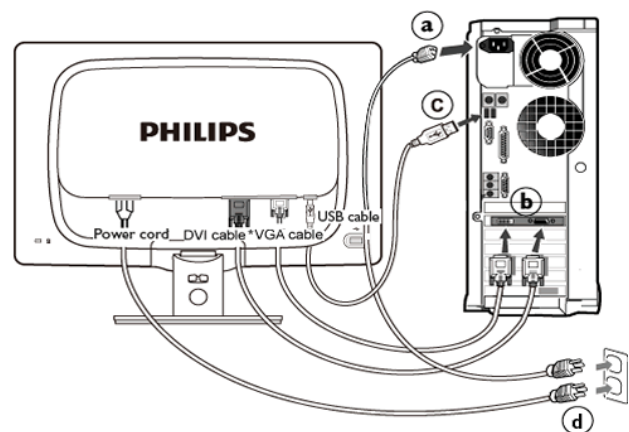
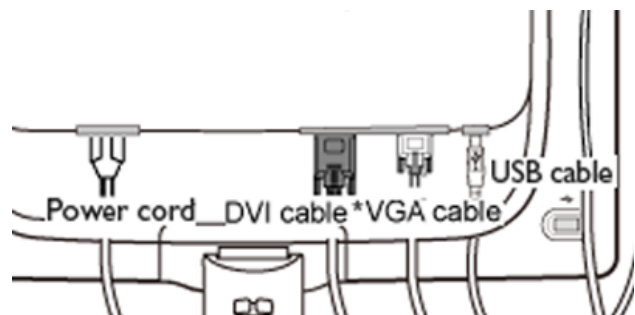
VGA cable



EDFU pack

Connecting to Your PC

1) Connect the power cord to the back of the monitor firmly.
(Philips has pre-connected VGA cable for the first installation.)

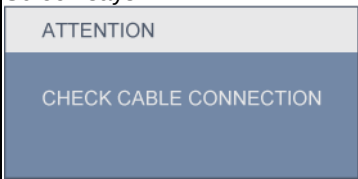


2) Connect to PC

- (a) Turn off your computer and unplug its power cable.
- (b) Connect the monitor signal cable to the video connector on the back of your computer.
- (c) Connect the USB cable to the USB port of your computer.
- (d) Plug the power cord of your computer and your monitor into a nearby outlet.
- (e) Turn on your computer and monitor. If the monitor displays an image, installation is complete.

Troubleshooting

This page deals with problems that can be corrected by a user. If the problem still persists after you have tried these solutions, contact Philips customer service representative.

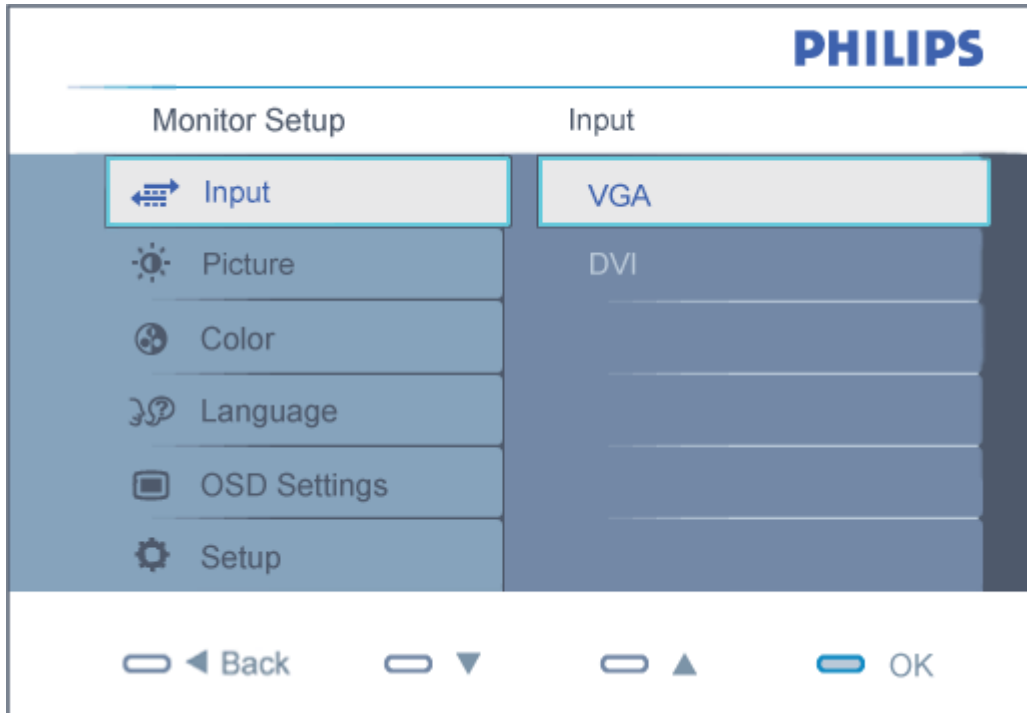
Common Problems	
Having this problem	Check these items
No Picture (Power LED not lit)	1. Make sure the power cord is plugged into the power outlet and into the back of the monitor. 2. First, ensure that the power button on the front of the monitor is in the OFF position, then press it to the ON position.
No Picture (Power LED is blinking)	1. Make sure the computer is turned on. 2. Make sure the signal cable is properly connected to your computer. 3. Check to see if the monitor cable has bent pins. 4. The Energy Saving feature may be activated
Screen says 	1. Make sure the monitor cable is properly connected to your computer. (Also refer to the Quick Set-Up Guide). 2. Check to see if the monitor cable has bent pins. 3. Make sure the computer is turned on.
AUTO button not working properly	1. The Auto Function is designed for use on standard Macintosh or IBM-compatible PCs running Microsoft Windows. 2. It may not work properly if using nonstandard PC or video card.
Imaging Problems	
Display position is incorrect	1. Press the Auto button. 2. Adjust the image position using the Phase/Clock of Setup in OSD Main Controls.
Image vibrates on the screen	1. Check that the signal cable is properly connected to the graphics board or PC.
Vertical flicker appears 	1. Press the Auto button. 2. Eliminate the vertical bars using the Phase/Clock of Setup in OSD Main Controls.
Horizontal flicker appears 	1. Press the Auto button. 2. Eliminate the vertical bars using the Phase/Clock of Setup in OSD Main Controls.
The screen is too bright or too dark	1. Adjust the contrast and brightness on On-Screen Display. (The backlight of the LCD monitor has a fixed life span. When the screen becomes dark or begins to flicker, please contact your sales representative).
An after-image appears	1. If an image remains on the screen for an extended period of time, it may be imprinted in the screen and leave an after-image. This usually disappears after a few hours
An after-image remains after the power has been turned off.	1. This is characteristic of liquid crystal and is not caused by a malfunction or deterioration of the liquid crystal. The after-image will disappear after a period of time.
Green, red, blue, dark, and white dots remains	1. The remaining dots are normal characteristic of the liquid crystal used in today's technology.
Adjust blue "power on" light	1. Adjust blue "power on" light using the power LED of Setup in OSD Main Controls.

On-Screen Display

Description of the On Screen Display

What is the On-Screen Display?

On-Screen Display (OSD) is a feature in all Philips LCD monitors. It allows an end user to adjust screen performance or select functions of the monitors directly through an on-screen instruction window. A user friendly on screen display interface is shown as below



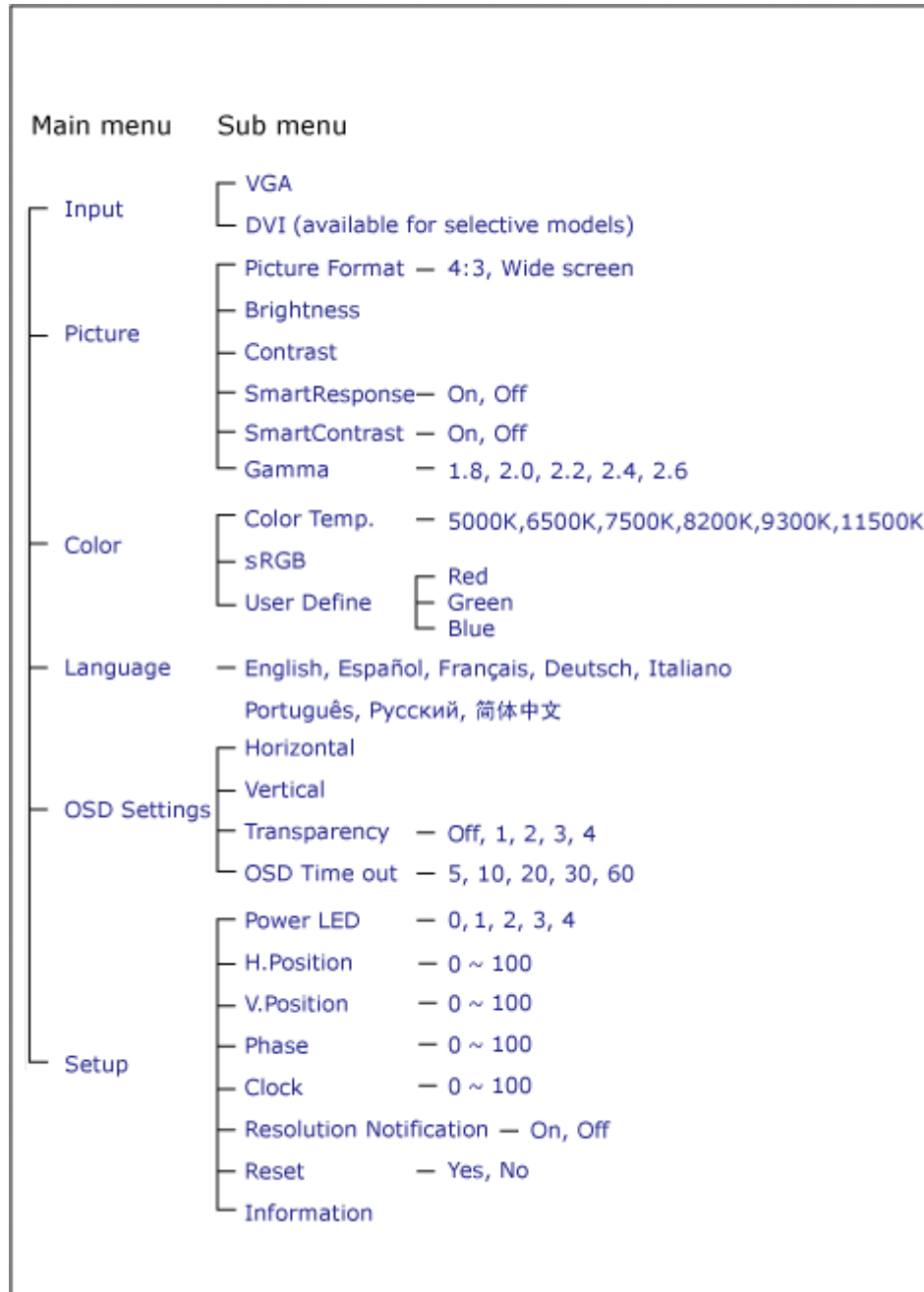
Basic and simple instruction on the control keys.

In the OSD shown above users can press ▼▲ buttons at the front bezel of the monitor to move the cursor, **OK** to confirm the choice or change.

On-Screen Display

The OSD Tree

Below is an overall view of the structure of the On-Screen Display. You can use this as a reference when you want to work your way around the different adjustments later on.



Resolution notification

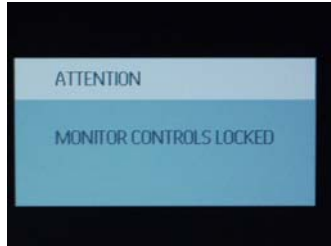
This monitor is designed for optimal performance at its native resolution, 1440x900@60Hz. When the monitor is powered on at a different resolution, an alert is displayed on screen: Use 1440x900@60Hz for best results.

Display of the native resolution alert can be switched off from Setup in the OSD (On Screen Display) menu.

Lock/Unlock,Aging,Factory Mode

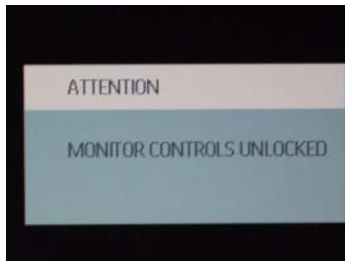
To lock/unlock OSD FUNCTION(User Mode)

The OSD function can be locked by pressing "OK" button(1) for more than 10 seconds, the screen shows following windows for 4 seconds. Every time when you press "OK" button, this message appears on the screen automatically .



Unlock OSD function

Unlocked OSD function can be released by pressing "OK" button for more than 10 seconds again.



Access Factory Mode

- 1). Turn off monitor.
- 2). [Push "EXIT" & "MENU" buttons at the same time and hold them]+[Press "power" button until comes out "Windows screen"] => then release all buttons
- 3). Press "MENU" button, wait until the OSD menu with Characters "MERIDIAN 190C1 V1.2 2009-04-24" (below OSD menu) come on the Screen of the monitor.



Factory Mode indicator

Factory Menu

Cursor can move on gray color area

Hot key function: by pressing " UP " and " DOWN " key Simultaneously at User Mode (or Factory Mode) (PS: The Offset R G B function can be used on reduce or eliminate snowy noise on the background when the resolution of video signal is 1680*1050vertical 60Hz. Slightly increase or decrease the value until snowy noise completely disappear .

Access Aging Mode

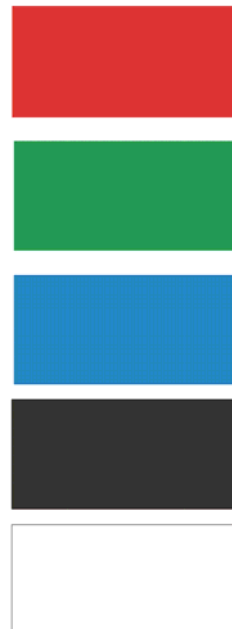
Step 1 : Access Factory Mode then enter Factory Menu.

Step 2 : By pressing " UP" and " DOWN " key to Burning Icon. Press "MENU" then press " UP" and "DOWN " key to turn on Aging Mode.



Step 3 : Disconnect interface cable between Monitor and PC.

After 3 seconds, bring up:



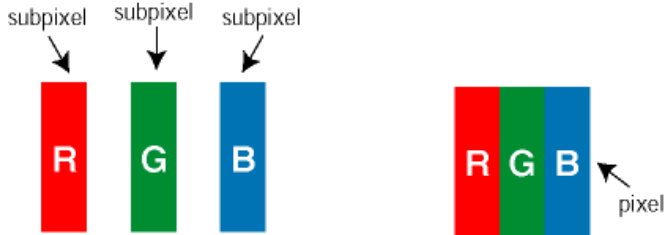
repeatedly

Connect Signal cable again=> go back to normal display

Philips Pixel Defect Policy

Philips' Flat Panel Monitors Pixel Defect Policy

Philips strives to deliver the highest quality products. We use some of the industry's most advanced manufacturing processes and practice stringent quality control. However, pixel or sub pixel defects on the TFT LCD panels used in flat panel monitors are sometimes unavoidable. No manufacturer can guarantee that all panels will be free from pixel defects, but Philips guarantees that any monitor with an unacceptable number of defects will be repaired or replaced under warranty. This notice explains the different types of pixel defects and defines acceptable defect levels for each type. In order to qualify for repair or replacement under warranty, the number of pixel defects on a TFT LCD panel must exceed these acceptable levels. For example, no more than 0.0004% of the sub pixels on a 19" XGA monitor may be defective. Furthermore, Philips sets even higher quality standards for certain types or combinations of pixel defects that are more noticeable than others. This policy is valid worldwide.



Pixels and Sub pixels

A pixel, or picture element, is composed of three sub pixels in the primary colors of red, green and blue. Many pixels together form an image. When all sub pixels of a pixel are lit, the three colored sub pixels together appear as a single white pixel. When all are dark, the three colored sub pixels together appear as a single black pixel. Other combinations of lit and dark sub pixels appear as single pixels of other colors.

Types of Pixel Defects

Pixel and sub pixel defects appear on the screen in different ways. There are two categories of pixel defects and several types of sub pixel defects within each category.

Bright Dot Defects Bright dot defects appear as pixels or sub pixels that are always lit or 'on'. That is, a *bright dot* is a sub-pixel that stands out on the screen when the monitor displays a dark pattern. There are the types of bright dot defects:



Two adjacent lit sub pixels:

- Red + Blue =

One lit red, green or blue sub pixel

Purple

- Red + Green =

Yellow

- Green + Blue =

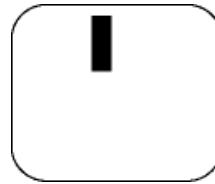
Cyan (Light Blue)

Three adjacent lit sub pixels (one white pixel)

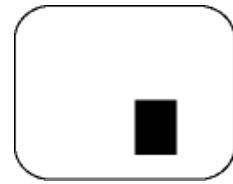


A red or blue *bright dot* must be more than 50 percent brighter than neighboring dots while a green *bright dot* is 30 percent brighter than neighboring dots.

Black Dot Defects Black dot defects appear as pixels or sub pixels that are always dark or 'off'. That is, a *dark dot* is a sub-pixel that stands out on the screen when the monitor displays a light pattern. These are the types of black dot defects:



One dark sub pixel



Two or three adjacent dark sub pixels

Proximity of Pixel Defects

Because pixel and sub pixels defects of the same type that are near to one another may be more noticeable, Philips also specifies tolerances for the proximity of pixel defects.

Pixel Defect Tolerances

In order to qualify for repair or replacement due to pixel defects during the warranty period, a TFT LCD panel in a Philips flat panel monitor must have pixel or sub pixel defects exceeding the tolerances listed in the following tables.

BRIGHT DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	190C1
1 lit subpixel	3
2 adjacent lit subpixels	1
3 adjacent lit subpixels (one white pixel)	0
Distance between two bright dot defects*	>15mm
Total bright dot defects of all types	3

BLACK DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	190C1
1 dark subpixel	5
2 adjacent dark subpixels	2
3 adjacent dark subpixels	0
Distance between two black dot defects*	>15mm
Total black dot defects of all types	5

TOTAL DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	190C1
Total bright or black dot defects of all types	5

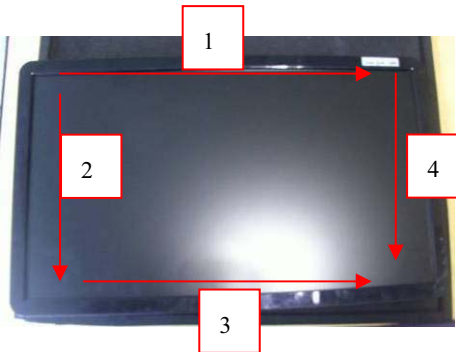
Note:

* 1 or 2 adjacent sub pixel defects = 1 dot defect

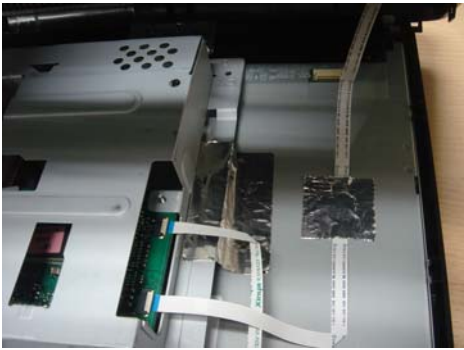
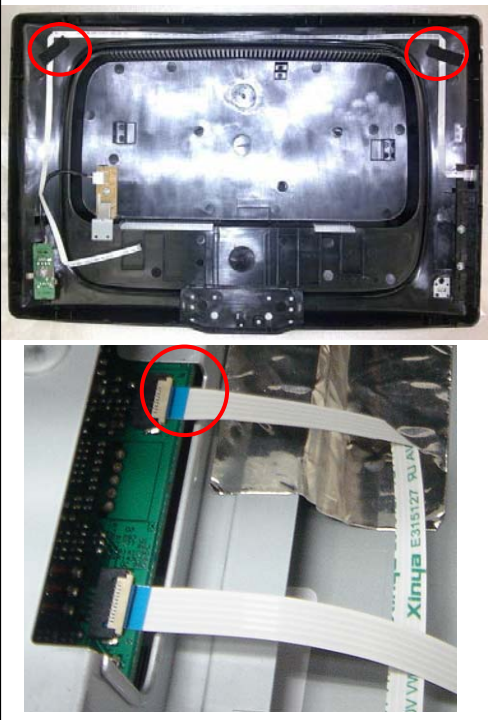
Mechanical Instruction

Preparation before disassemble

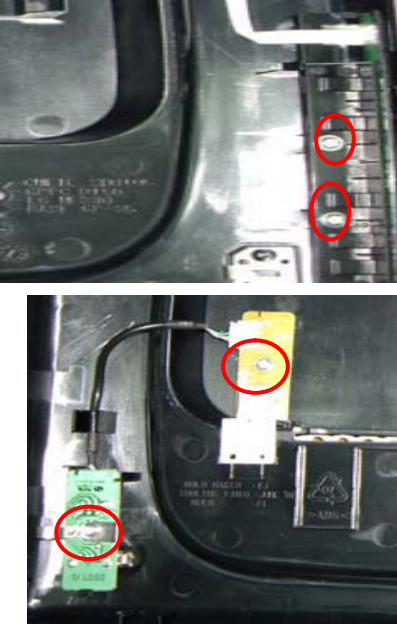
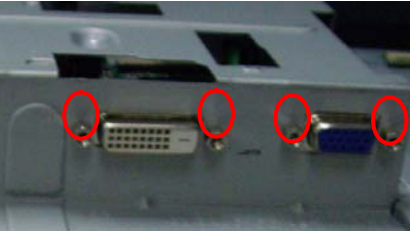
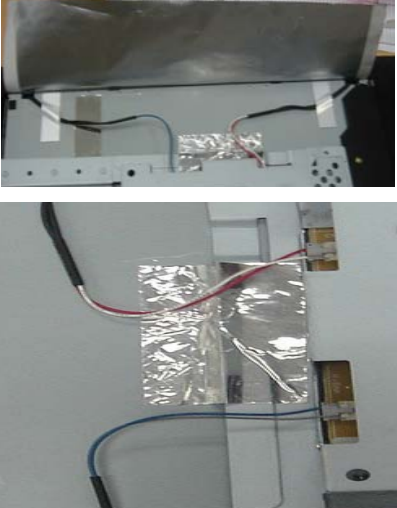
- 1.Clean the room for disassemble
- 2.Identify the area for monitor
- 3.Check the position that the monitors be placed and the quantity of the monitor ;prepare the area for material flow; according to the actual condition plan the disassemble layout
- 4.Prepare the implement, equipments, materials as bellow:
 - 1) Press-fixture
 - 2) working table
 - 3) Screw-driver
 - 4) knife*1
 - 5) glove
 - 6) cleaning cloth
 - 7) ESD protection
 - 8) plus driver

item	picture	Operation	Tool	Notes
1		Disassemble the base, press the circular button Bring the hinge		
2		Disassemble the clip, use a small screw-driver prize up	Screw- driver	
3		Disassemble the stand, → 6 screws	plus driver	
4		disassembly the bezel from the monitor, notice the disassembly order : 1.Top (1) parts of bezel 2.Left (2) parts of bezel 3.Bottom (3) parts of bezel 4. Right (4) parts of bezel Don't draw the BZL		When disassembly the bezel ,notice don't bend the C/B .man must wear glove The purpose is loose the BZL

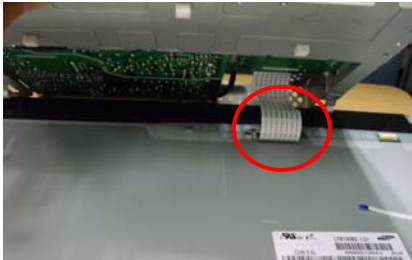
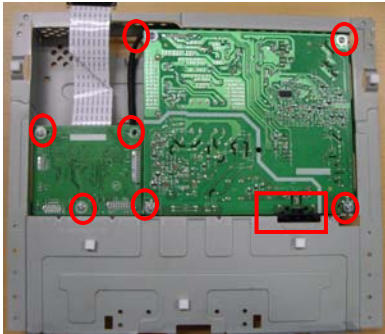
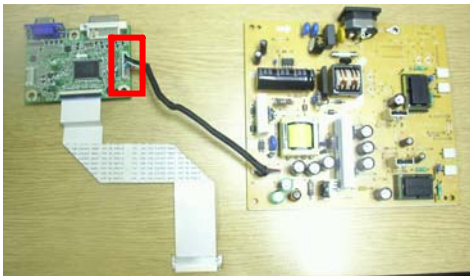
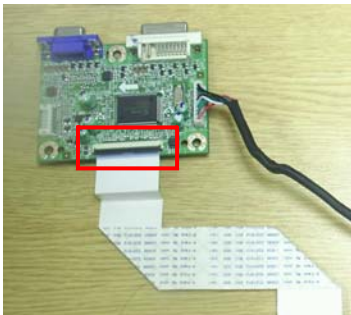
Mechanical Instruction

5		Turn over the monitor ,Uplift the Rear cover from the monitor		Don't dismantle the Rear cover
6		Tear off the AL tape		
7		Draw the ffc cable Take off the rear cover		
8		Tear off these two acetic tapes Take the entire internal mechanism from Bezel and then put it on the cushion Draw the ffc cable		

Mechanical Instruction

9		Disassembled the rear cover : C/B screw *2 USB screw*1 The other USB screw*1 Then tear off one gasket on the top of the USB PCBA.	Plus driver	
10		Disassembled the Main-BKT : hexagonal screw *4	Screw-driver	
11		Tear off the top AL tape.		
12		Tear off this Mylar AL tape on the top of lamp cable, Pull out disassemble the lamp cables		Notes the below PIC Then the designed Main-BKT will help to pull out the wires Man can raise the Lock of Lamp and then Pull out the lamp easily

Mechanical Instruction

13		Tear off the right and left AL tape		
14		Uplift the Main-BKT unlock the LVDS by using two hands(see note).		Please carefully use two hands(one hand presses the locking-latch of FFC cable's housing, and at the same time another hand pulls out the FFC cable.) for this step to avoid from deforming the terminals of positive-locking type FFC cable.
15		Disassemble the Power board 7 screws Tear off the cover of AC-SOCKET	Plus driver	
16		Take the PCBA from Main-BKT and then put it on the cushion		
17		Pull out the cable of Power board		Notes: Pull the connect upright

Color Adjustment

Alignment procedure

1. Turn on the LCD monitor .
2. Turn on the Timing/pattern generator. See Fig.1
3. Preset LCD color Analyzer CA-1 10
 - Remove the lens protective cover of probe CA-A30.
 - Set measuring/viewing selector to measuring position for reset analyzer .(zero calibration) as Fig.2
 - Turn on the color analyzer (CA-1 10)
 - Press 0-CAL button to starting reset analyzer .

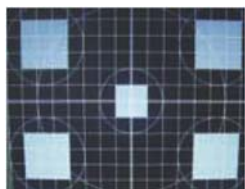


Fig. 1

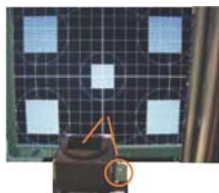


Fig.2

4. Access Factory Mode

- 1). Turn off monitor.
- 2). [Push "AUT O" & "MENU" buttons at the same time and hold them] +[Press "power" button untill comes out "Windows screen"] => then release all buttons
- 3).Press "MENU" button, wait until the OSD menu with Characters" MERIDIAN 190C1 V1.2 2009-04-24 " (below OSD menu) come on the Screen of the monitor as shown in Fig3.



Factory Mode indicator

Fig. 3

- 4). Press button, then select factory mode indicator by "MENU" "LEFT" or "RIGHT" button .Press"MENU" button to bring up submenu windows as below:



Fig. 4



Fig.5

5.Display

Press "UP" or "DOWN" button to select . Change the value by "UP" or "DOWN" key until the X, Y co-ordinates as below

5.1 Color temperature adjustment

There are six factory preset white color 11500K, 9300K, 8200K, 7500K, 6500K, sRGB, 5000K

Align by Philips PerfectTune (also called FGA) function.

Apply full white pattern, with brightness in 100 % position and the contrast control at 50 % position.

The 1931 CIE Chromaticity (color triangle) diagram (x , y) coordinate for the screen center should be:

Product specification		Production alignment spec.	
CIE coordinates	(x,y)	CIE coordinates	(x,y)
11500K	x = 0.270 ± 0.02 y = 0.281 ± 0.02	11500K	x = 0.270 ± 0.006 y = 0.281 ± 0.006
9300K	x = 0.283 ± 0.02 y = 0.297 ± 0.02	9300K	x = 0.283 ± 0.006 y = 0.297 ± 0.006
8200K	x = 0.291 ± 0.02 y = 0.306 ± 0.02	8200K	x = 0.291 ± 0.006 y = 0.306 ± 0.006
7500K	x = 0.298 ± 0.02 y = 0.314 ± 0.02	7500K	x = 0.298 ± 0.006 y = 0.314 ± 0.006
6500K/sRGB	x = 0.313 ± 0.02 y = 0.329 ± 0.02	6500K/sRGB	x = 0.313 ± 0.006 y = 0.329 ± 0.006
sRGB	x = 0.313 ± 0.02 y = 0.329 ± 0.02	sRGB	x = 0.313 ± 0.006 y = 0.329 ± 0.006
5000K	x = 0.345 ± 0.02 y = 0.357 ± 0.02	5000K	x = 0.345 ± 0.006 y = 0.357 ± 0.006

Quality Inspection specification:

CIE coordinates	(x,y)
9300K	x = 0.283 ± 0.015 y = 0.297 ± 0.015
6500K/sRGB	x = 0.313 ± 0.015 y = 0.329 ± 0.015
sRGB	x = 0.313 ± 0.015 y = 0.329 ± 0.015

FAQs (Frequently Asked Questions)

General FAQs

Q: When I install my monitor what should I do if the screen shows 'Cannot display this video mode'?

A: Recommended video mode for Philips 19": 1440x900 @60Hz.

1. Unplug all cables, then connect your PC to the monitor that you used previously.
2. In the Windows Start Menu, select Settings/Control Panel. In the Control Panel Window, select the Display icon. Inside the Display Control Panel, select the 'Settings' tab. Under the setting tab, in box labeled 'desktop area', move the slider bar to 1440x900 pixels (19").
3. Open 'Advanced Properties' and set the Refresh Rate to 60Hz, then click OK.
4. Restart your computer and repeat step 2 and 3 to verify that your PC is set at 1440x900@60Hz (19").
5. Shut down your computer, disconnect your old monitor and reconnect your Philips LCD monitor.
6. Turn on your monitor and then turn on your PC.

Q: What are the .inf and .icm files on the CD-ROM? How do I install the drivers (.inf and .icm)?

A: These are the driver files for your monitor. Follow the instructions in your user manual to install the drivers. Your computer may ask you for monitor drivers (.inf and .icm files) or a driver disk when you first install your monitor. Follow the instructions to insert the (companion CD-ROM) included in this package. Monitor drivers (.inf and .icm files) will be installed automatically.

Q: How do I adjust the resolution?

A: Your video card/graphic driver and monitor together determine the available resolutions. You can select the desired resolution under Windows® Control Panel with the "Display properties".

Q: What if I get lost when I am making monitor adjustments?

A: Simply press the MENU button, the Setup button, then select 'Reset' to recall all of the original factory settings.

Q: What is the Auto function?

A: The *AUTO adjustment* key restores the optimal screen position, phase and clock settings by pressing of a single button – without the need to navigate through OSD (On Screen Display) menus and control keys.

Note: Auto function is available in selected models only.

Q: My Monitor has no power (Power LED does not light up). What should I do?

A: Make sure the AC power cord is connected between the monitor and AC outlet, and click a key on keyboard/mouse to wake up the PC.

Q: Will the LCD monitor accept an interlaced signal under PC models?

A: No. If an Interlace signal is used, the screen displays both odd and even horizontal scanning lines at the same time, thus distorting the picture.

Q: What does the Refresh Rate mean for LCD?

A: Unlike CRT display technology, in which the speed of the electron beam is swept from the top to the bottom of the screen determines flicker, an active matrix display uses an active element (TFT) to control each individual pixel and the refresh rate is therefore not really applicable to LCD technology.

Q: Will the LCD screen be resistant to scratches?

A: A protective coating is applied to the surface of the LCD, which is durable to a certain extent (approximately up to the hardness of a 2H pencil). In general, it is recommended that the panel surface is not subject to any excessive shocks or scratches.

Q: How should I clean the LCD surface?

A: For normal cleaning, use a clean, soft cloth. For extensive cleaning, please use isopropyl alcohol. Do not use other solvents such as ethyl alcohol, ethanol, acetone, hexane, etc.

Q: Can I change the color setting of my monitor?

A: Yes, you can change your color setting through OSD control as the following procedures,

1. Press "MENU" to show the OSD (On Screen Display) menu
2. Press "Down Arrow" to select the option "Color" then press "OK" to enter color setting, there are three settings as below.
 - a. Color Temperature; The six settings are 5000K, 6500K, 7500K, 8200K, 9300K and 11500K. With settings in the 5000K range the panel appears 'warm,' with a red-white color tone, while a 11500K temperature yields 'cool, blue-white toning.'
 - b. sRGB; this is a standard setting for ensuring correct exchange of colors between different device (e.g. digital cameras, monitors, printers, scanners, etc)
 - c. User Define; the user can choose his/her preference color setting by adjusting red, green blue color.
 - d. Gamma; The five settings are 1.8, 2.0, 2.2, 2.4, and 2.6.

*A measurement of the color of light radiated by an object while it is being heated. This measurement is expressed in terms of absolute scale, (degrees Kelvin). Lower Kelvin temperatures such as 2004K are red; higher temperatures such as 9300K are blue. Neutral temperature is white, at 6504K.

Screen Adjustments

Q: When I install my monitor, how do I get the best performance from the monitor?

A: For best performance, make sure your display settings are set at 1440x900@60Hz for 19".

Q: How do LCDs compare to CRTs in terms of radiation?

A: Because LCDs do not use an electron gun, they do not generate the same amount of radiation at the screen surface.

Compatibility with other Peripherals

Q: Can I connect my LCD monitor to any PC, workstation or Mac?

A: Yes. All Philips LCD monitors are fully compatible with standard PCs, Macs and workstations. You may need a cable adapter to connect the monitor to your Mac system. Please contact your Philips sales representative for more information.

Q: Are Philips LCD monitors Plug-and-Play?

A: Yes, the monitors are Plug-and-Play compatible with Windows® 95, 98, 2000, XP and Vista.

Q: What is USB (Universal Serial Bus)?

A: Think of USB as a smart plug for PC peripherals. USB automatically determines resources (like driver software and bus bandwidth) required by peripherals. USB makes necessary resources available without user intervention. There are three main benefits of USB. USB eliminates "case anxiety," the fear of removing the computer case to install circuit board cards -- that often requires adjustment of complicated IRQ settings -- for add-on peripherals. USB does away with "port gridlock." Without USB, PCs are normally limited to one printer, two Com port devices (usually a mouse and modem), one Enhanced Parallel Port add-on (scanner or video camera, for example), and a joystick. More and more peripherals for multimedia computers come on the market every day. With USB, up to 127 devices can run simultaneously on one computer. USB permits "hot plug-in." No need to shut down, plug in, reboot and run set up to install peripherals. No need to go through the reverse process to unplug a device. Bottom line: USB transforms today's "Plug-and-Pray" into true Plug-and-Play!

Please refer to glossary for more information about USB.

Q: What is a USB hub ?

A: A USB hub provides additional connections to the Universal Serial Bus. A hub's upstream port connects a hub to the host, usually a PC. Multiple downstream ports in a hub allows connection to another hub or device, such as a USB keyboard, camera or printer.

FAQs (Frequently Asked Questions)

LCD Panel Technology

Q: What is a Liquid Crystal Display?

A: A Liquid Crystal Display (LCD) is an optical device that is commonly used to display ASCII characters and images on digital items such as watches, calculators, portable game consoles, etc. LCD is the technology used for displays in notebooks and other small computers. Like light-emitting diode and gas-plasma technologies, LCD allows displays to be much thinner than cathode ray tube (CRT) technology. LCD consumes much less power than LED and gas-displays because it works on the principle of blocking light rather than emitting it.

Q: What differentiates passive matrix LCDs from active matrix LCDs?

A: An LCD is made with either a passive matrix or an active matrix display grid. An active matrix has a transistor located at each pixel intersection, requiring less current to control the luminance of a pixel. For this reason, the current in an active matrix display can be switched on and off more frequently, improving the screen refresh time (your mouse pointer will appear to move more smoothly across the screen, for example). The passive matrix LCD has a grid of conductors with pixels located at each intersection in the grid.

Q: What are the advantages of TFT LCD compared with CRT?

A: In a CRT monitor, a gun shoots electrons and general light by colliding polarized electrons on fluorescent glass. Therefore, CRT monitors basically operate with an analog RGB signal. A TFT LCD monitor is a device that displays an input image by operating a liquid crystal panel. The TFT has a fundamentally different structure than a CRT. Each cell has an active matrix structure and independent active elements. A TFT LCD has two glass panels and the space between them is filled with liquid crystal. When each cell is connected with electrodes and impressed with voltage, the molecular structure of the liquid crystal is altered and controls the amount of inlet lighting to display images. A TFT LCD has several advantages over a CRT, since it can be very thin and no flickering occurs because it does not use the scanning method.

Q: Why is vertical frequency of 60Hz optimal for an LCD monitor?

A: Unlike a CRT monitor, the TFT LCD panel has a fixed resolution. For example, an XGA monitor has 1024x3 (R, G, B) x 768 pixels and a higher resolution may not be available without additional software processing. The panel is designed to optimize the display for a 65MHz dot clock, one of the standards for XGA displays. Since the vertical/horizontal frequency for this dot clock is 60Hz/48kHz, the optimum frequency for this monitor is 60Hz.

Q: What kind of wide-angle technology is available? How does it work?

A: The TFT LCD panel is an element that controls/displays the inlet of a backlight using the dual-refraction of a liquid crystal. Using the property that the projection of inlet light refracts toward the major axis of the liquid element, it controls the direction of inlet light and displays it. Since the refraction ratio of inlet light on liquid crystal varies with the inlet angle of the light, the viewing angle of a TFT is much narrower than that of a CRT. Usually, the viewing angle refers to the point where the contrast ratio is 10. Many ways to widen the viewing angle are currently being developed and the most common approach is to use a wide viewing angle film, which widens the viewing angle by varying the refraction ratio. IPS (In Plane Switching) or MVA (Multi Vertical Aligned) is also used to give a wider viewing angle.

Q: Why is there no flicker on an LCD Monitor?

A: Technically speaking, LCDs do flicker, but the cause of the phenomenon is different from that of a CRT monitor -- and it has no impact of the ease of viewing. Flickering in an LCD monitor relates to usually undetectable luminance caused by the difference between positive and negative voltage. On the other hand, CRT flickering that can irritate the human eye occurs when the on/off action of the fluorescent object becomes visible. Since the reaction speed of liquid crystal in an LCD panel is much slower, this troublesome form of flickering is not present in an LCD display.

Q: Why is an LCD monitor virtually low of Electro Magnetic Interference?

A: Unlike a CRT, an LCD monitor does not have key parts that generate Electro Magnetic Interference, especially magnetic fields. Also, since an LCD display utilizes relatively low power, its power supply is extremely quiet.

Ergonomics, Ecology and Safety Standards

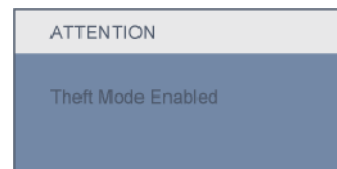
Q: What is the CE mark?

A: The CE (Conformité Européenne) mark is required to be displayed on all regulated products offered for sale on the European market. This 'CE' mark means that a product complies with the relevant European Directive. A European Directive is a European 'Law' that relates to health, safety, environment and consumer protection, much the same as the U.S. National Electrical Code and UL Standards.

Q: Does the LCD monitor conform to general safety standards?

A: Yes. Philips LCD monitors conform to the guidelines of TCO Displays 5.0 standards for the control of radiation, electromagnetic waves, energy reduction, electrical safety in the work environment and recyclability. The specification page provides detailed data on safety standards.

Q: After I change new PC, I found this information on screen, how can I do?



A: Because you activate Theft Deterrence function in SmartControl II. Please contact IT manager or Philips Service Center.

Electrical Instructions

Electrical characteristics

1. Interface signals

1.1. D-Sub Analog

Input signal: Video, Hsync., Vsync c

Video: 0.7 Vp-p, input impedance, 75 ohm @DC

Sync.: Separate sync

TTL level, input impedance 2.2k ohm terminate

Hsync Positive/Negative

Vsync Positive/Negative

Composite sync TTL level, input impedance 2.2k ohm terminate (Positive/Negative)

Sync on green video 0.3 Vp-p Negative (Video 0.7 Vp-p Positive)

1.2. DVI-D Digital

Input signal: Single TMDS link

(Three channels: RX0-/+, RX1-/+, RX2-/+)

1.3. USB PLUG support

Input signal: Upstream input (V_{BUS} , D+, D-, GND) via USB-B receptacle.

Output signal: Downstream output (V_{BUS} , D+, D-, GND) through USB-A receptacle

2. Interface

2.1. D-Sub Cable

Length : 1.8 M +/- 50 mm

Fix with monitor when packing, with transplant pin protective cover.

Connector type : D-Sub male with DDC2B pin assignments.

Blue connector thumb-operated jack screws

2.2. DVI Cable

The input signals are applied to the display through DVI-D cable.

Length : 1.8 M +/- 50 mm

Connector type : DVI-D male with DDC-2B pin assignments

White connector thumb-operated jackscrews

3. Timing requirement

3.1. Factory Preset mode definition:

3.1.1. Perfect FOS while presenting all required timings.

3.1.2. Required timings need to be specified in User's Manual

3.2. Preset mode definition:

3.2.1. Need to support those timings.

3.2.2. Perfect FOS after auto adjustment.

3.3. 3.3 User mode

3.3.1. Can save those timing that not in Preset mode and can be showed (not over scalar or Panel spec.)

3.3.2. It needs to reserve the 12 timings space in memory size.

3.3.3 Factory preset modes

19W Preset Mode					
Item	H.Freq. (KHz)	Mode	Resolution	V.Freq. (Hz)	BW(MHz)
1	31.469	IBM VGA 10H	640x350	70.086	
2	31.469	IBM VGA 3H	720x400	70.087	
3	31.469	IBM VGA 12H	640x480	59.94	
4	35	MACINTOSH	640x480	67	
5	37.861	VESA	640x480	72.809	
6	37.5	VESA	640x480	75	
7	43.269	VESA	640x480	85.008	
8	35.156	VESA	800x600	56.25	
9	37.879	VESA	800x600	60.317	
10	48.077	VESA	800x600	72.188	
11	46.875	VESA	800x600	75	
12	53.674	VESA	800x600	85.061	
13	49.7	MACINTOSH	832x624	75	
14	56.4	-	960x720	75	
15	44.75	-	960x720	60	
16	48.363	VESA	1024x768	60.004	
17	56.476	VESA	1024x768	70.069	
18	60.023	VESA	1024x768	75.029	
19	61.08	IBM XGA-2	1024x768	75.781	
20	68.677	VESA	1024x768	84.997	
21		CVT 2.3MA	1280 x768	60	
22	60.289	CVT 2.3MA	1280 x768	75	
23	54.1		1152x864	60	
24	63.851	VESA	1152x864	70.012	
25	67.5	VESA	1152x864	75	
26	68.7	MACINTOSH	1152x870	75	
27	61.845	SUN WS	1152x900	66.004	
28	71.81	SUN WS	1152x900	76.15	
29	49.7	CVT	1280x800	59.81	
30	62.8	CVT	1280x800	74.93	
31	60	VESA	1280x960	60	
32	75	VESA	1280x960	75	
33	63.981	VESA	1280x1024	60.02	
34	71.691	SUN WS	1280x1024	67.189	
35	76	DOS/V	1280x1024	72	
36	79.976	VESA	1280x1024	75.025	
37	81.13	SUN WS	1280x1024	76.11	
38	91.1	VESA	1280x1024	85	
39	44.772	-	1280x720	60	
40	52.5	-	1280x720	70	
41	64	CVT-reduced blanking	1400x1050	60	
42	80	CVT	1400x1050	75	
43	91.1	CVT	1400x1050	85	
44	55.469	VESA-reduced blanking mode	1440x900	59.901	88.75
45	55.935	VESA	1440x900	59.887	106.5
46	70.635	VESA	1440x900	74.984	136.75
47	75	VESA	1600x1200	60	161
48	66.587	CVT 2.3MA-R	1920x1080	60.0 (for DVI-D)	138.5
49	65.29	CVT1.76MW	1680x1050	60	146
50		CVT1.76MW-R	1680x1050	60	119

Factory Preset mode:
13 Sets

Preset mode: 50 Sets

User mode: 10 Sets

Electrical Instructions

Color temperature adjustment

There are six factory preset white color 11500K, 9300K, 8200K, 7500K, 6500K, sRGB, 5000K

Align by Philips PerfectTune (also called FGA) function.

Apply full white pattern, with brightness in 100 % position and the contrast control at 50 % position.

The 1931 CIE Chromaticity (color triangle) diagram (x , y) coordinate for the screen center should be:

Product specification

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9300K	x = 0.283 ± 0.02 y = 0.297 ± 0.02	
8200K	x = 0.291 ± 0.02 y = 0.306 ± 0.02	
7500K	x = 0.298 ± 0.02 y = 0.314 ± 0.02	
6500K/sRGB	x = 0.313 ± 0.02 y = 0.329 ± 0.02	
sRGB	x = 0.313 ± 0.02 y = 0.329 ± 0.02	
5000K	x = 0.345 ± 0.02 y = 0.357 ± 0.02	

Production alignment spec.

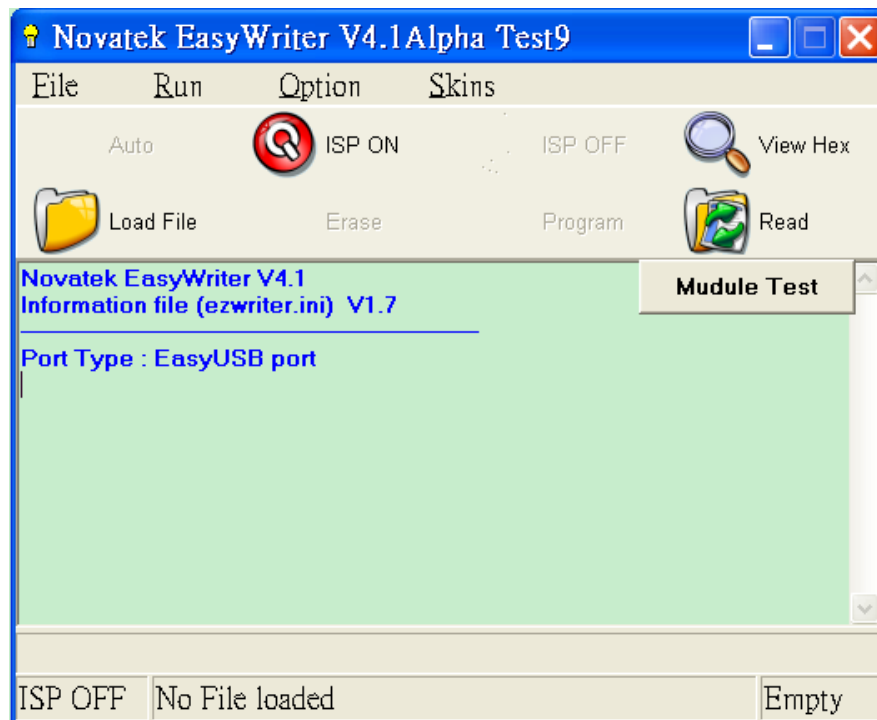
CIE coordinates	(x,y)	
11500K	x = 0.270 ± 0.006 y = 0.281 ± 0.006	
9300K	x = 0.283 ± 0.006 y = 0.297 ± 0.006	
8200K	x = 0.291 ± 0.006 y = 0.306 ± 0.006	
7500K	x = 0.298 ± 0.006 y = 0.314 ± 0.006	
6500K/sRGB	x = 0.313 ± 0.006 y = 0.329 ± 0.006	
sRGB	x = 0.313 ± 0.006 y = 0.329 ± 0.006	
5000K	x = 0.345 ± 0.006 y = 0.357 ± 0.006	

Quality Inspection specification:

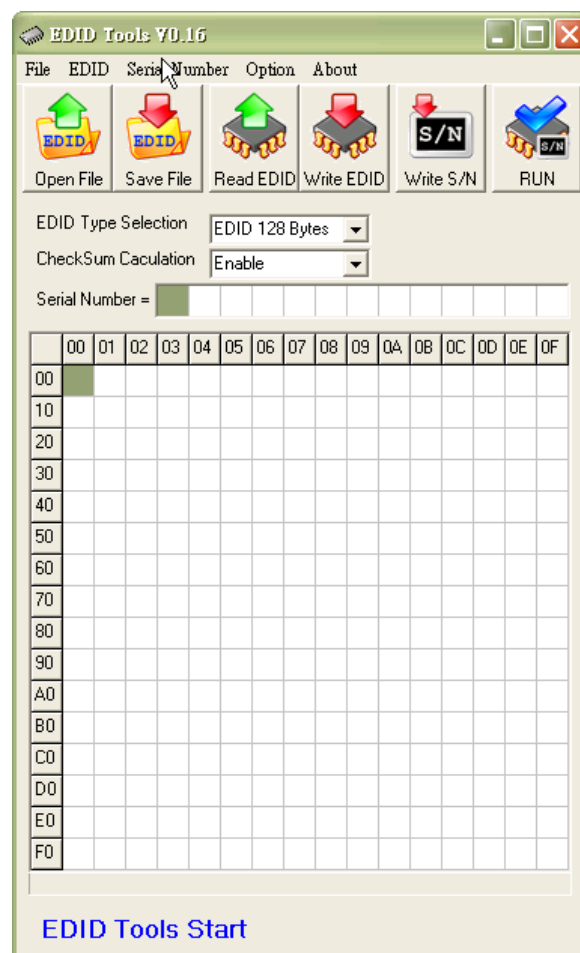
CIE coordinates	(x,y)	
9300K	x = 0.283 ± 0.015 y = 0.297 ± 0.015	
6500K/sRGB	x = 0.313 ± 0.015 y = 0.329 ± 0.015	
sRGB	x = 0.313 ± 0.015 y = 0.329 ± 0.015	

Service tool-Software

FW writing tool: Easy Writer V4.1



DDC writing tool: Q-EDID-V16



DDC Instructions

DDC Data Re-programming

In case the DDC data memory IC or main EEPROM which storage all factory settings were replaced due to a defect, the serial numbers have to be re-programmed "Analog DDC IC, Digital DDC IC & EEPROM".

It is advised to re-soldered DDC IC and main EEPROM from the old board onto the new board if circuit board have been replaced, in this case the DDC data does not need to be re-programmed.

Additional information

Additional information about DDC (Display Data Channel) may be obtained from Video Electronics Standards Association (VESA).

Extended Display Identification Data(EDID) information may be also obtained from VESA.

Configuration and procedure

"PI-EDID" The software is provided by IMS to upgrade the firmware of CPU.

PI-EDID Tools is for the interface between "Parallel Port of PC" and "15 pin-D-SUB connector of Monitor".

It is a windows-based program, which cannot be run in MS-DOS.

System and equipment requirements

1. An Pentium (or above) personal computer or compatible.
2. Microsoft operation system Windows 95/98/2000/XP and Port95NT.exe.
3. EDID Software "PI-EDID.exe"
4. ISP board as shown in Fig. 1

And I2C Board Jump wire should follow J10 (short), J9 (open), J5/J6/ (1 and 2 pin short) J7/J8 (1 and 2 pin short)

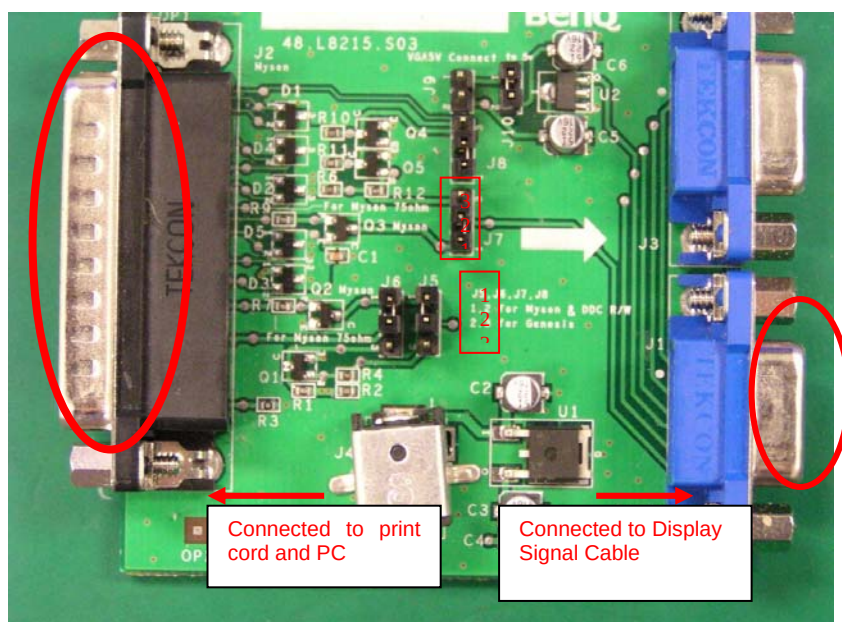


Fig.1

DDC Instructions

5. Connect and Mains cord to Monitor as shown in Fig.2.

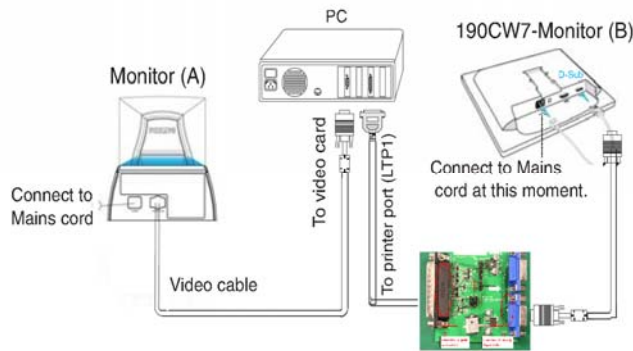
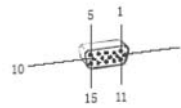


Fig.2

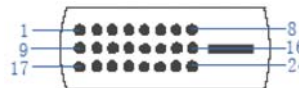
Pin assignments :

A. 15-pin D-Sub Connector



PIN No.	SIGNAL	PIN No.	SIGNAL
1	Red	9	DDC +3.3V or +5V
2	Green/ SOG	10	Logic GND
3	Blue	11	Sense (GND)
4	Sense (GND)	12	Bi-directional data
5	Cable Detect (GND)	13	H/H+V sync
6	Red GND	14	V-sync
7	Green GND	15	Data clock
8	Blue GND		

B. Input DVI-D Connector pin



Pin No.	Description
1	T.M.D.S. data2-
2	T.M.D.S. data2+
3	T.M.D.S. data2 shield
4	No Connect
5	No Connect
6	DDC clock
7	DDC data
8	No Connect
9	T.M.D.S. data1-
10	T.M.D.S. data1+
11	T.M.D.S. data1 shield
12	No Connect
13	No Connect
14	+5V Power
15	Ground (for +5V)
16	Hot plug detect
17	T.M.D.S. data0-
18	T.M.D.S. data0+
19	T.M.D.S. data0 shield
20	No Connect
21	No Connect
22	T.M.D.S clock shield
23	T.M.D.S. clock+
24	T.M.D.S. clock-

DDC Instructions

6. Setup the Philips-IMS EDID Tools program

Step 1: Open Q-EDID Software into your folder as shown in Fig.3. and Fig.4.



Fig.3

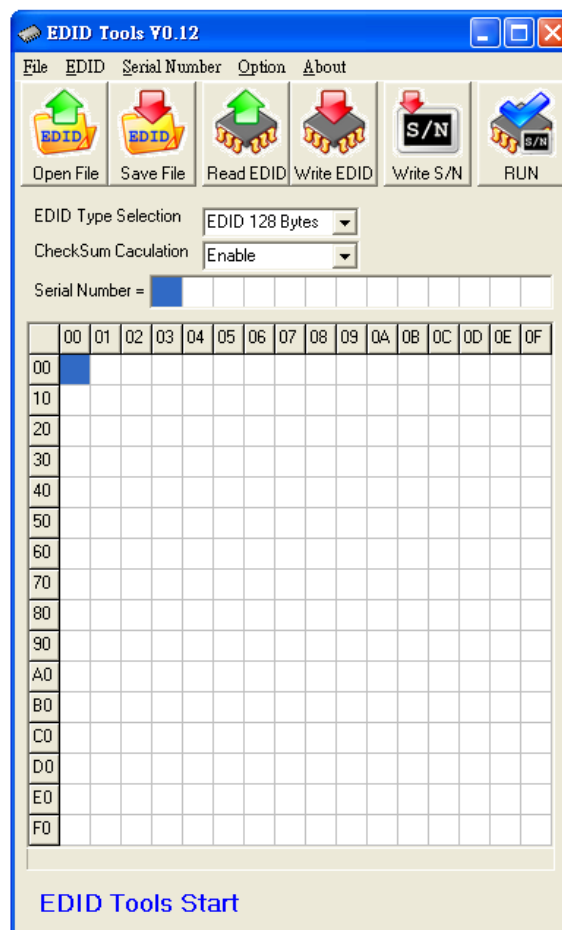


Fig.4

DDC Instructions

Step 2: Press “Open File” then choose LCD_Analog.ddc or LCD_DVI.ddc as shown in Fig. 5 .

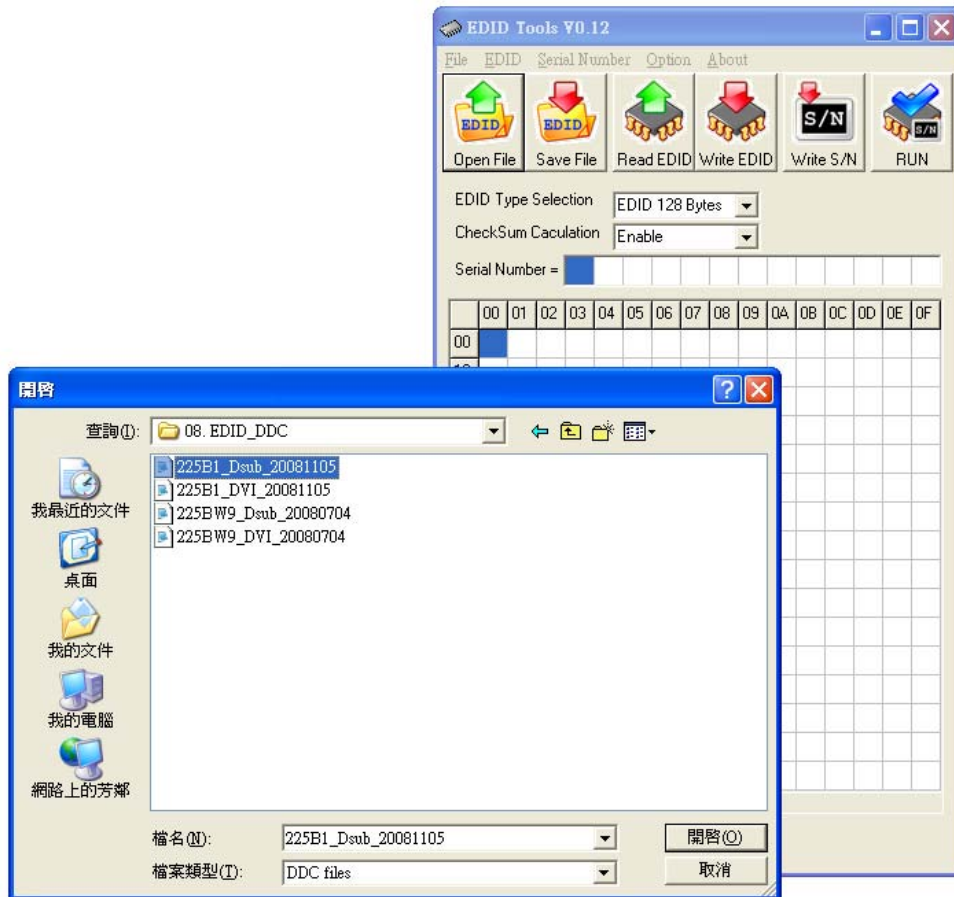


Fig.5

DDC Instructions

Step 3 : Load DDC file success as shown in Fig. 6 .

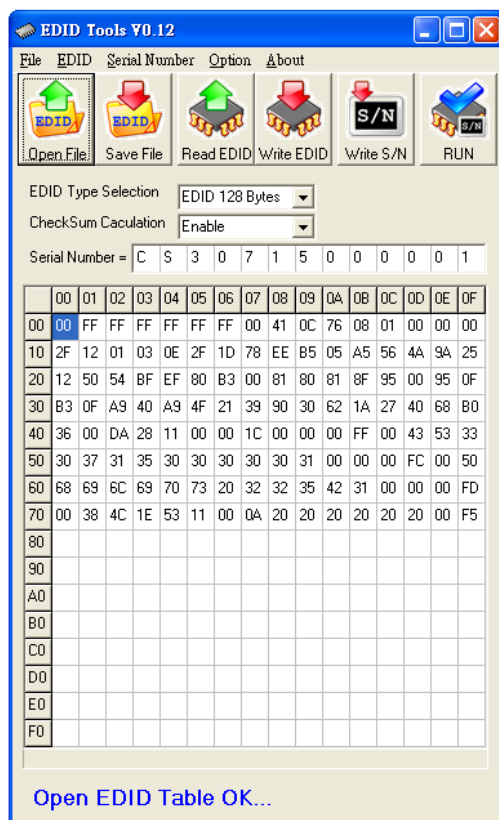


Fig.6

Step 4 : update Serial number and press enter to correct S/N number shown as Fig.7 .

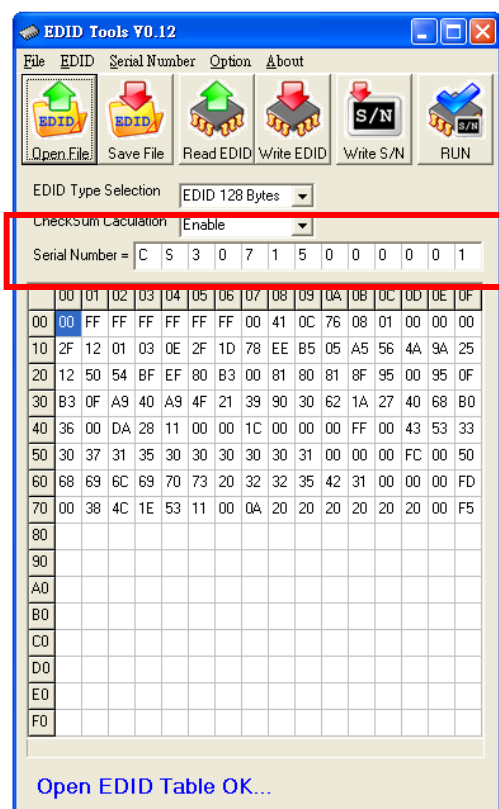


Fig.7

DDC Instructions

Step 5 : Press “RUN” to write EDID and serial number shown as Fig.8 .

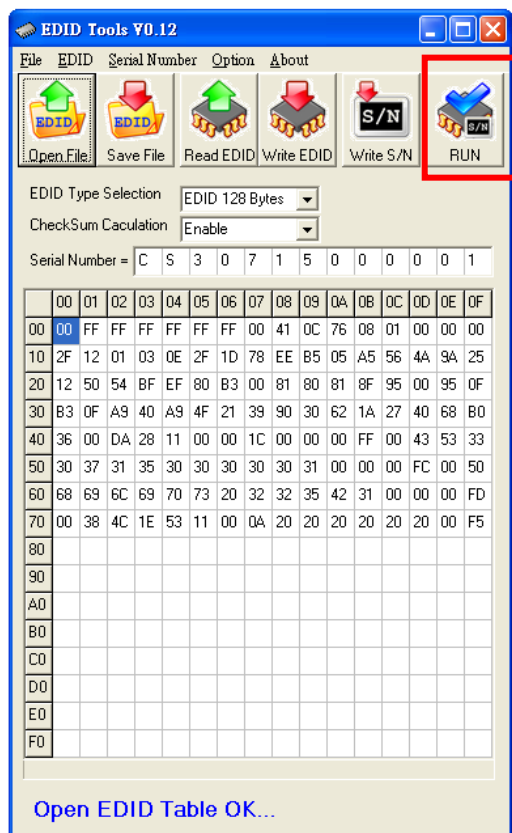


Fig.8

Step 6 : EDID and serial number update success shown as Fig.9

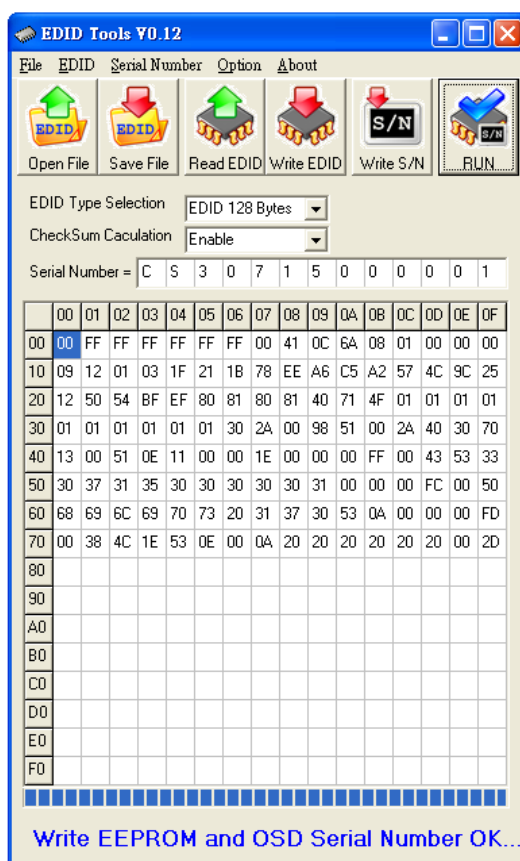


Fig.9

DDC Instructions

8. Press Monitor Menu Key to check OSD Serial number is the same as PI-EDID write data as shown in Fig.10

Note: If not the same, please rewrite EDID S/N again.

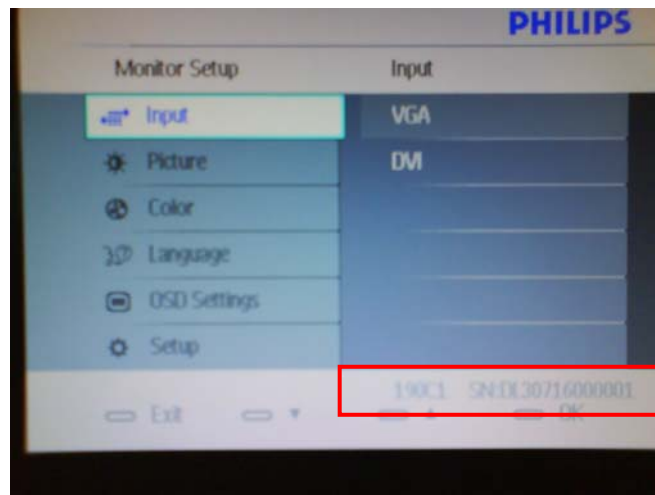
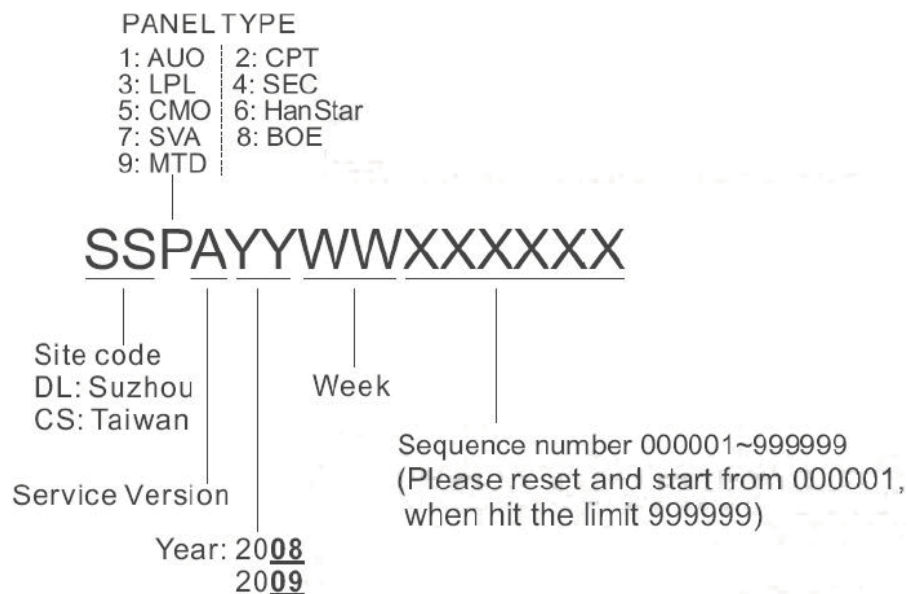


Fig.14

9. Turn off the monitor, exit the factory mode.

Serial Number Definition



DDC DATA

Analog DDC

/////////Displaying Monitor EDID/////////

128 bytes EDID Data (Hex):

	0	1	2	3	4	5	6	7	8	9
0:	00	FF	FF	FF	FF	FF	FF	00	41	0C
10:	37	C0	01	00	00	0A	13	01	03	
20:	0E	28	19	78	EE	DE	95	A3	54	4C
30:	99	26	0F	50	54	BF	EF	80	95	00
40:	71	4F	81	80	95	0F	01	01	01	01
50:	01	01	01	01	9A	29	A0	D0	51	84
60:	22	30	50	98	36	00	98	FF	10	00
70:	00	1C	00	00	00	FF	00	30	30	30
80:	30	30	30	30	30	30	30	30	30	31
90:	00	00	00	FC	00	50	68	69	6C	69
100:	70	73	20	31	39	30	43	0A	00	00
110:	00	FD	00	38	4C	1E	53	0E	00	0A
120:	20	20	20	20	20	20	00	42		

Decoded EDID data

<---Header--->

Header: 00 FF FF FF FF FF FF 00

<-x-Header-x->

<---Vendor/Product Identification--->

ID Manufacturer Name: PHL
 ID Product Code: 49207
 ID Serial Number: 00000001
 Week of Manufacture: 10
 Year of Manufacture: 2009

<-x-Vendor/Product Identification-x->

<---EDID Structure Version/Revision--->

EDID Version#: 1
 EDID Revision#: 3

<-x-EDID Structure Version/Revision-x->

<---Basic Display Parameters/Features--->

Video i/p definition: Analog
 Setup: Blank-to-Black not expected
 Seperate Syncs. support: Yes
 Composite Sync. support: Yes
 Vsync. Pulse: serration required
 Max Horz Image Size: 40 cm.
 Max Vert Image Size: 25 cm.
 Display Gamma: 2.2
 Display Type: RGB color display
 Standard Default Color Space: Yes
 Features, Preferred Timing Mode: In first detailed block
 Features, GTF support: No
 DPMS Features, Stand-by: Yes
 DPMS Features, Suspend: Yes
 DPMS Features, Active Off: Yes

<-x-Basic Display Parameters/Features-x->

<---Color Characteristics--->

Red x: 0.639648
 Red y: 0.329102
 Green x: 0.299805
 Green y: 0.599609
 Blue x: 0.150391
 Blue y: 5.95703e-002
 White x: 0.313477
 White y: 0.329102

<-x-Color Characteristics-x->

<---Established Timings--->

Established Timings 1: BF

- 720x400 @70Hz
 - 640x480 @60Hz
 - 640x480 @67Hz
 - 640x480 @72Hz
 - 640x480 @75Hz
 - 800x600 @56Hz
 - 800x600 @60Hz

Established Timings 2: EF

- 800x600 @72Hz
 - 800x600 @75Hz
 - 832x624 @75Hz
 - 1024x768 @60Hz
 - 1024x768 @70Hz
 - 1024x768 @75Hz
 - 1280x1024 @75Hz
 - 1152x870x75Hz

Established Timings 3: 80

<-x-Established Timings-x->

<---Standard Timing Identification--->

Standard Timing: 1440x1440 @60Hz
 Standard Timing: 1152x864 @75Hz
 Standard Timing: 1280x1024 @60Hz
 Standard Timing: 1440x1440 @75Hz

<-x-Standard Timing Identification-x->

<---Detailed Timing Descriptions--->

Detailed Timing: 1440x900 @59Hz
 Detailed Timing: FF (Monitor SN) '00000000000001'
 Detailed Timing: FC (Monitor name) 'Philips 190C'
 Detailed Timing: FD (Monitor limits)
 Vert: 56 - 76 Hz
 Horz: 30 - 83 KHz
 Clk: 140 MHz

<-x-Detailed Timing Descriptions-x->

Extension Flag: 00

Checksum: 42

DDC DATA

DVI DDC

/////////Displaying Monitor EDID/////////

128 bytes EDID Data (Hex):

	0	1	2	3	4	5	6	7	8	9
0:	00	FF	FF	FF	FF	FF	FF	00	41	0C
10:	37	C0	01	00	00	0A	13	01	03	
20:	80	28	19	78	EE	DE	95	A3	54	4C
30:	99	26	0F	50	54	BF	EF	80	95	00
40:	71	4F	81	80	95	0F	01	01	01	01
50:	01	01	01	01	9A	29	A0	D0	51	84
60:	22	30	50	98	36	00	98	FF	10	00
70:	00	1C	00	00	00	FF	00	30	30	30
80:	30	30	30	30	30	30	30	30	30	31
90:	00	00	00	FC	00	50	68	69	6C	69
100:	70	73	20	31	39	30	43	0A	00	00
110:	00	FD	00	38	4C	1E	53	0E	00	0A
120:	20	20	20	20	20	20	00	D0		

Decoded EDID data

<---Header--->

Header: 00 FF FF FF FF FF FF 00

<-x-Header-x->

<---Vendor/Product Identification--->

ID Manufacturer Name: PHL
ID Product Code: 49207
ID Serial Number: 00000001
Week of Manufacture: 10
Year of Manufacture: 2009

<-x-Vendor/Product Identification-x->

<---EDID Structure Version/Revision--->

EDID Version#: 1
EDID Revision#: 3

<-x-EDID Structure Version/Revision-x->

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Video i/p definition: Digital
Setup: Blank-to-Black not expected
Seperate Syncs. support: No
Composite Sync. support: No
Vsync. Pulse: serration not required
Max Horz Image Size: 40 cm.
Max Vert Image Size: 25 cm.
Display Gamma: 2.2
Display Type: RGB color display
Standard Default Color Space: Yes
Features, Preferred Timing Mode: In first detailed block
Features, GTF support: No
DPMS Features, Stand-by: Yes
DPMS Features, Suspend: Yes
DPMS Features, Active Off: Yes

<-x-Basic Display Parameters/Features-x->

<---Color Characteristics--->

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Red y: 0.329102
Green x: 0.299805
Green y: 0.599609
Blue x: 0.150391
Blue y: 5.95703e-002
White x: 0.313477
White y: 0.329102

<-x-Color Characteristics-x->

<---Established Timings--->

Established Timings 1: BF

- 720x400 @70Hz
- 640x480 @60Hz
- 640x480 @67Hz
- 640x480 @72Hz
- 640x480 @75Hz
- 800x600 @56Hz
- 800x600 @60Hz

Established Timings 2: EF

- 800x600 @72Hz
- 800x600 @75Hz
- 832x624 @75Hz
- 1024x768 @60Hz
- 1024x768 @70Hz
- 1024x768 @75Hz
- 1280x1024 @75Hz
- 1152x870x75Hz

Established Timings 3: 80

<-x-Established Timings-x->

<---Standard Timing Identification--->

Standard Timing: 1440x1440 @60Hz
Standard Timing: 1152x864 @75Hz
Standard Timing: 1280x1024 @60Hz
Standard Timing: 1440x1440 @75Hz

<-x-Standard Timing Identification-x->

<---Detailed Timing Descriptions--->

Detailed Timing: 1440x900 @59Hz
Detailed Timing: FF (Monitor SN) '00000000000001'
Detailed Timing: FC (Monitor name) 'Philips 190C'
Detailed Timing: FD (Monitor limits)
Vert: 56 - 76 Hz
Horz: 30 - 83 KHz
Clk: 140 MHz

<-x-Detailed Timing Descriptions-x->

Extension Flag: 00
Checksum: D0

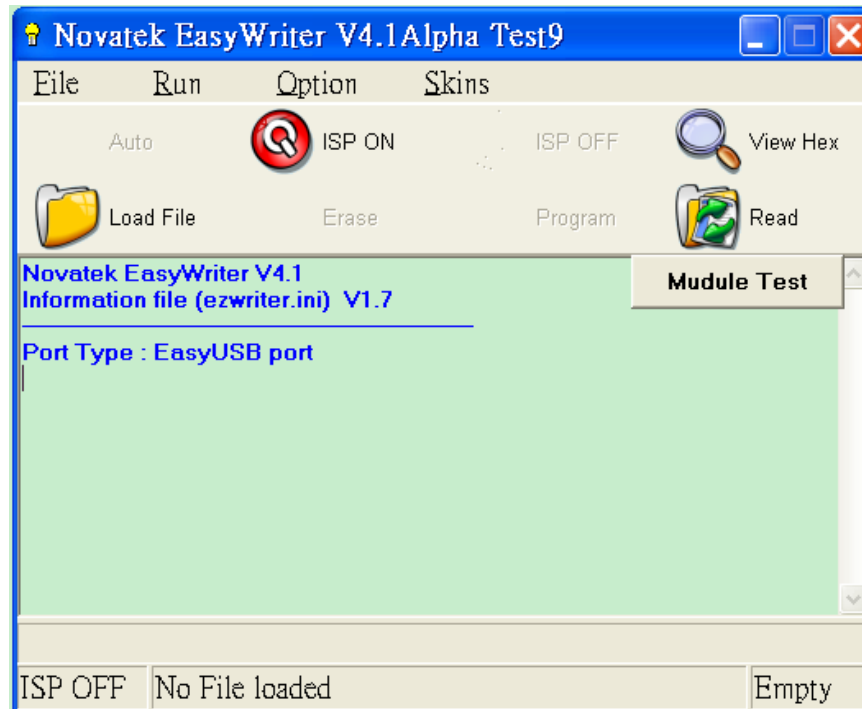
Firmware Upgrade for CPU

Step 1: Install Port95nt.exe

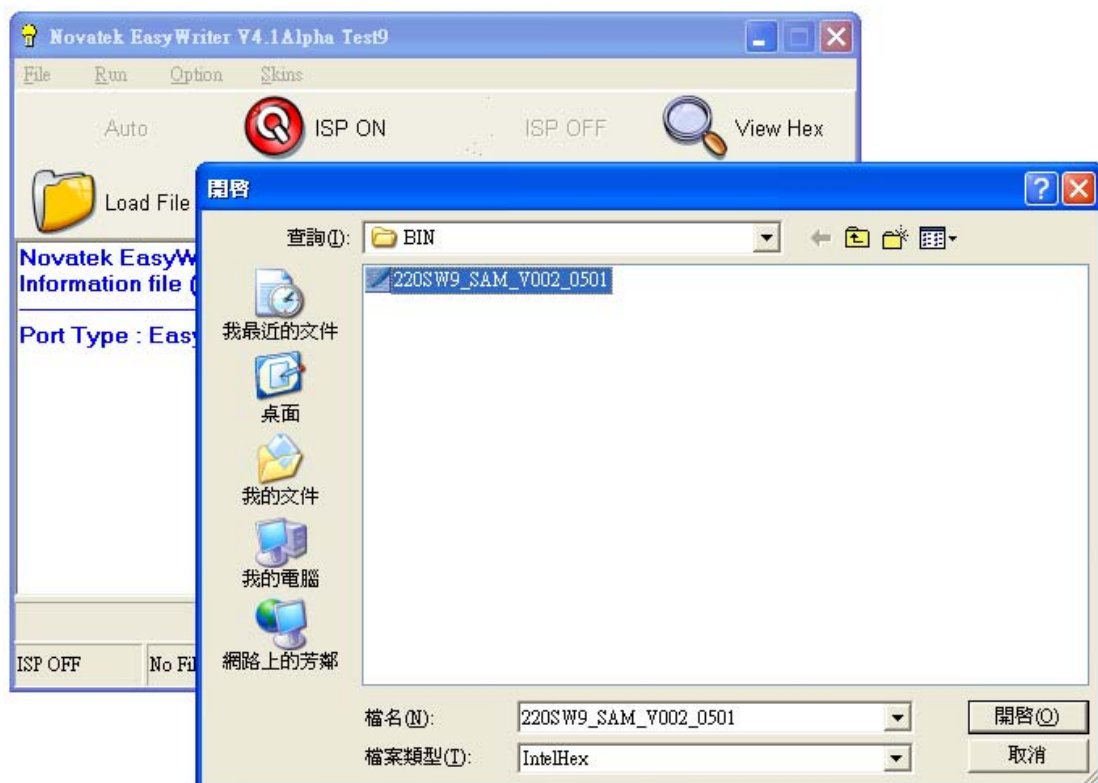
Restart computer.

Step 2 : Double click "EasyUSB Writer\Writer_t9.exe"

Press Load File

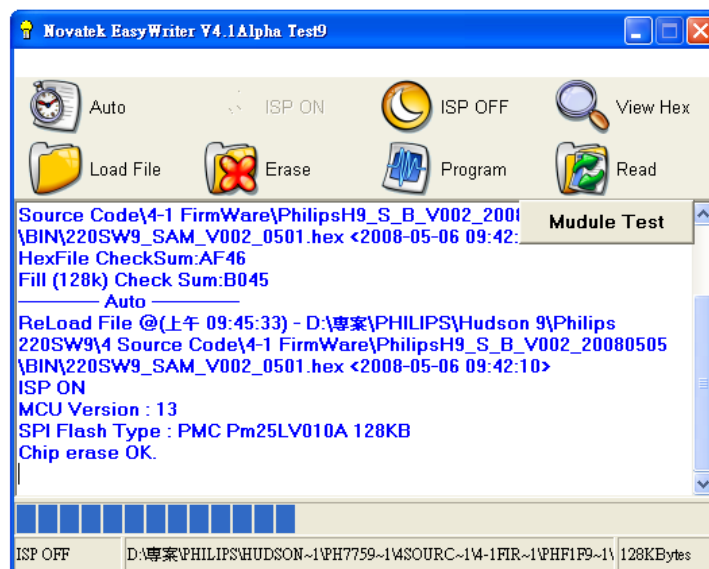
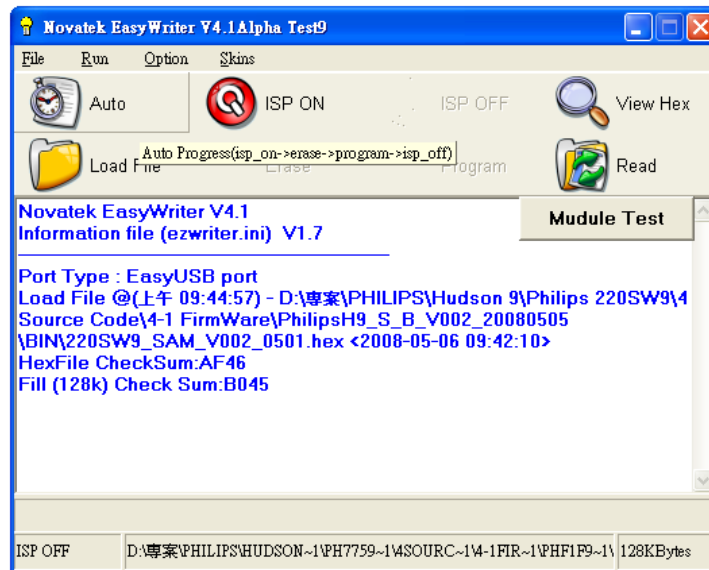


Step 3 : Choose *.hex

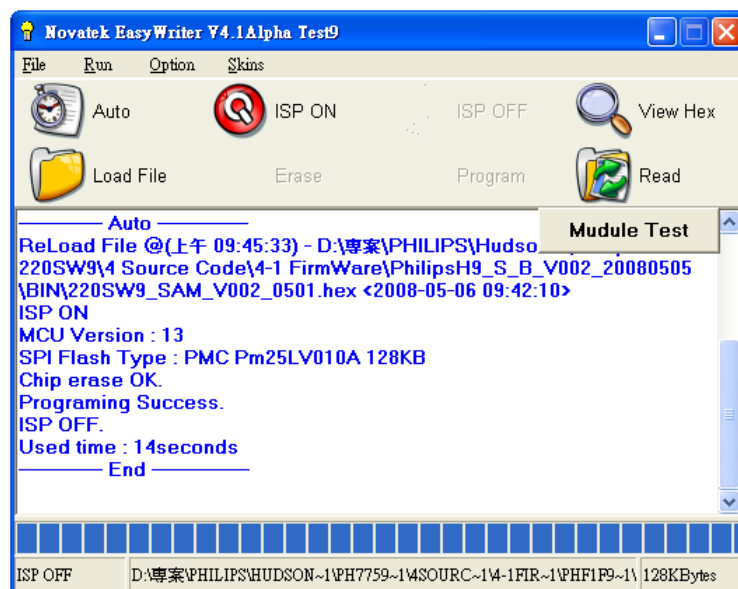


Firmware Upgrade for CPU

Step 4 : Press “Auto” to update F/W



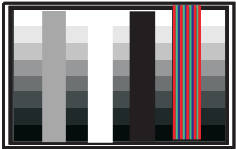
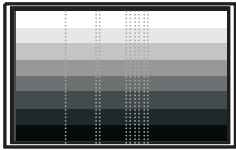
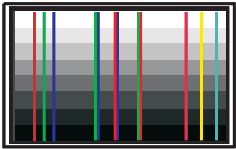
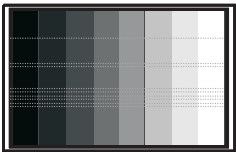
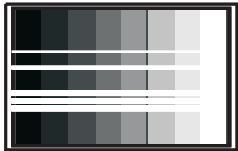
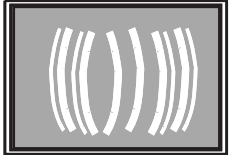
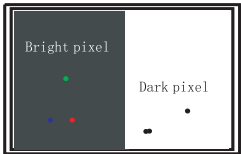
Step 5 : Update OK !!



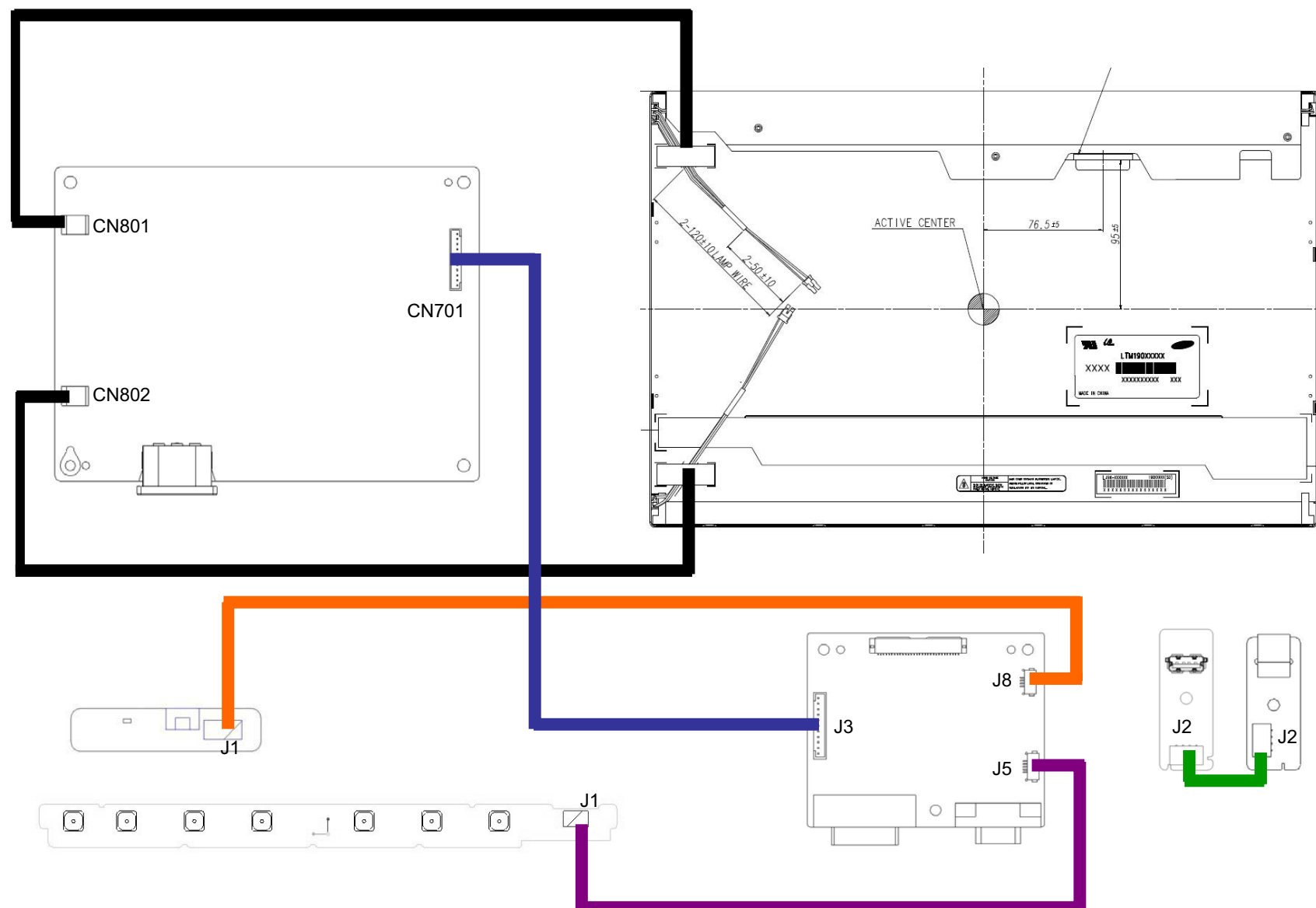
Failure Mode Of Panel

Quick reference for failure mode of LCD panel

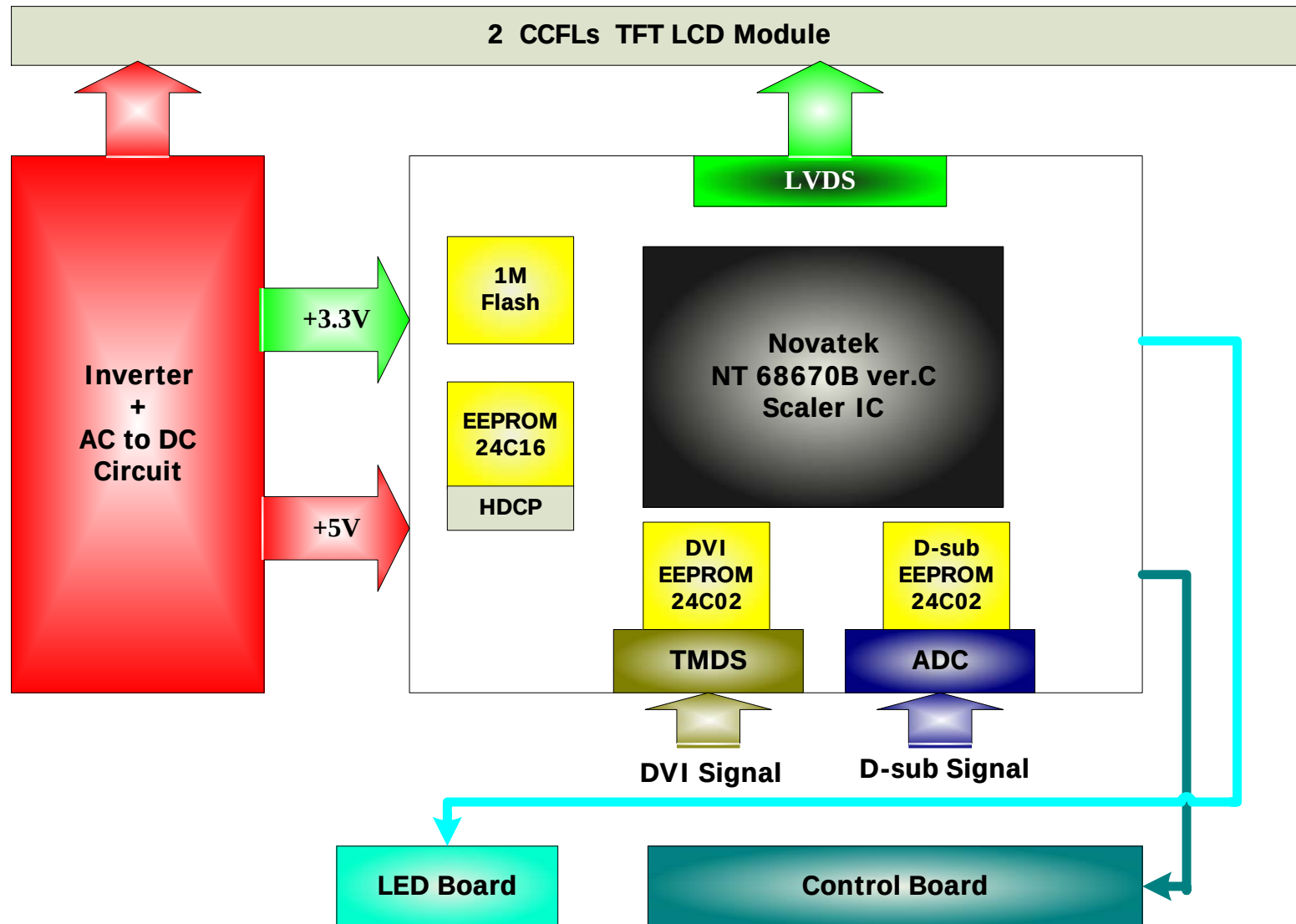
this page presents problems that could be made by LCD panel.
It is not necessary to repair circuit board. Simply follow the mechanical instruction on this manual to eliminate failure by replace LCD panel.

Failure description	Phenomenon		
		Polarizer has bubbles	
Vertical block defect		Polarizer has bubbles	
Vertical dim lines			
Vertical lines defect (Always bright or dark)		Foreign material inside polarizer . It shows liner or dot shape.	
Horizontal block defect		Concentric circle formed	
Horizontal dim lines		Bottom back light of LCD is brighter than normal	
Horizontal lines defect (Always bright or dark)		Back light un-uniformity	
Has bright or dark pixel		Backlight has foreign material. Black or white color, liner or circular type	

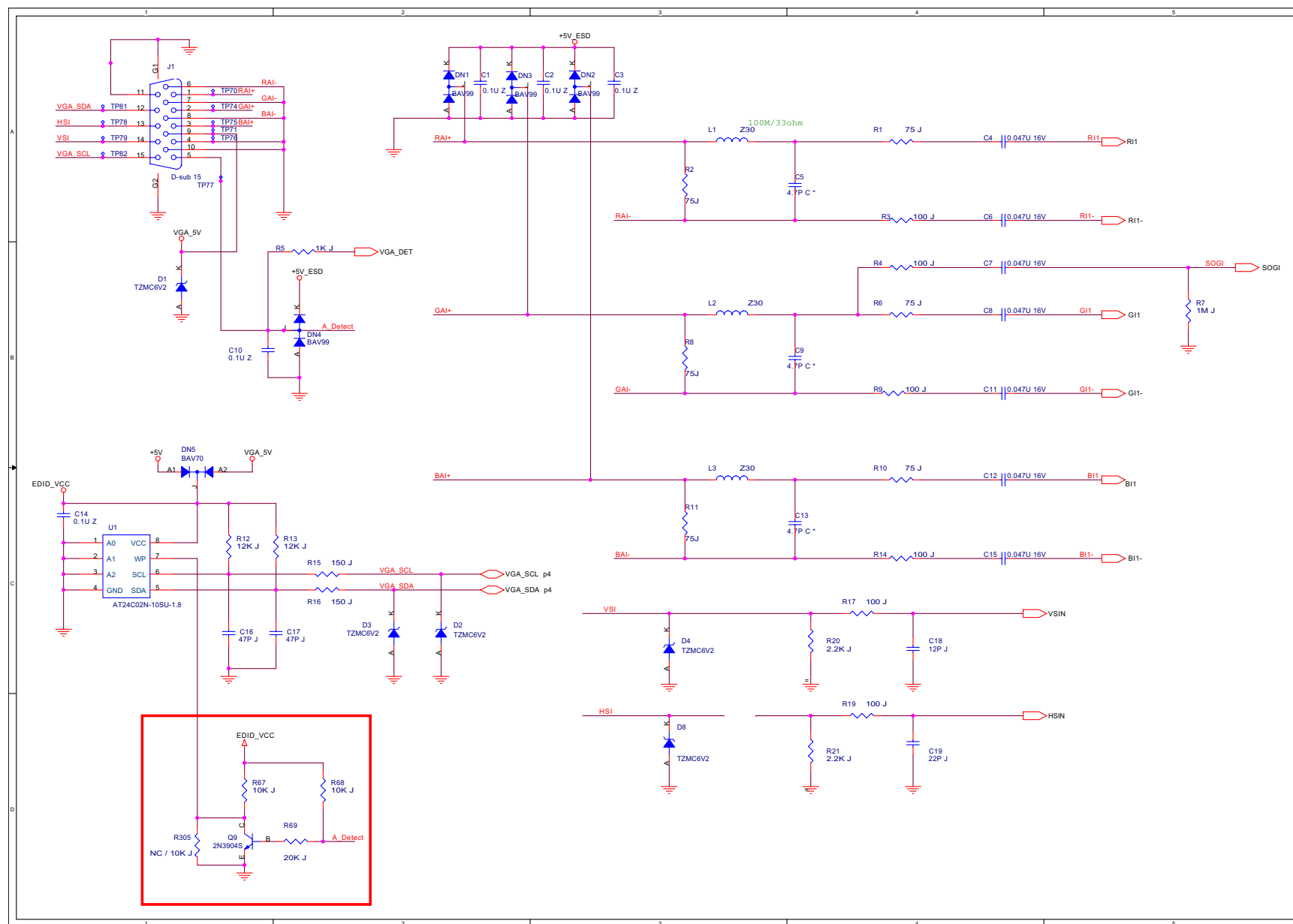
Wiring Diagram



Block Diagram

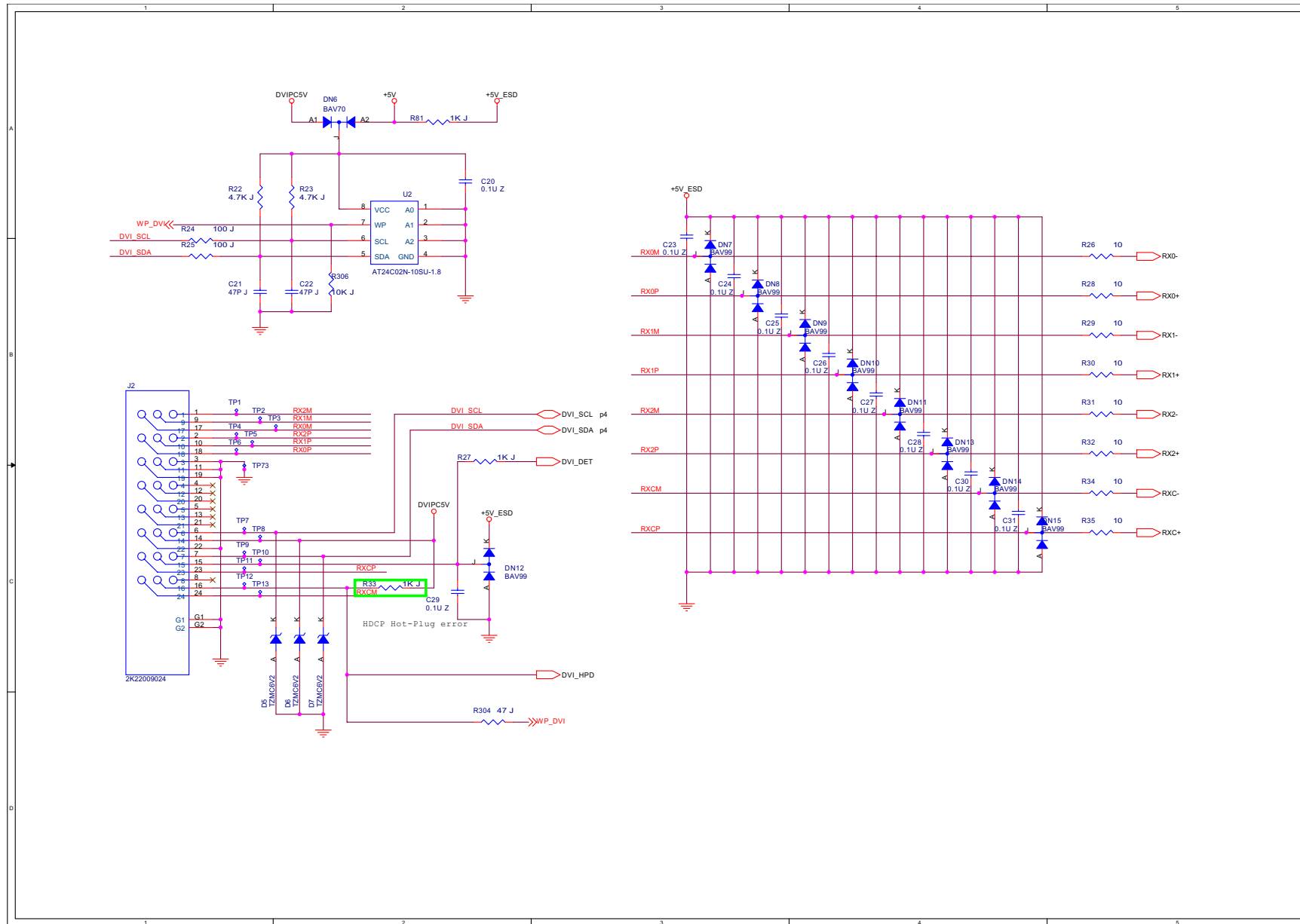


Scalar Diagram & C.B.A



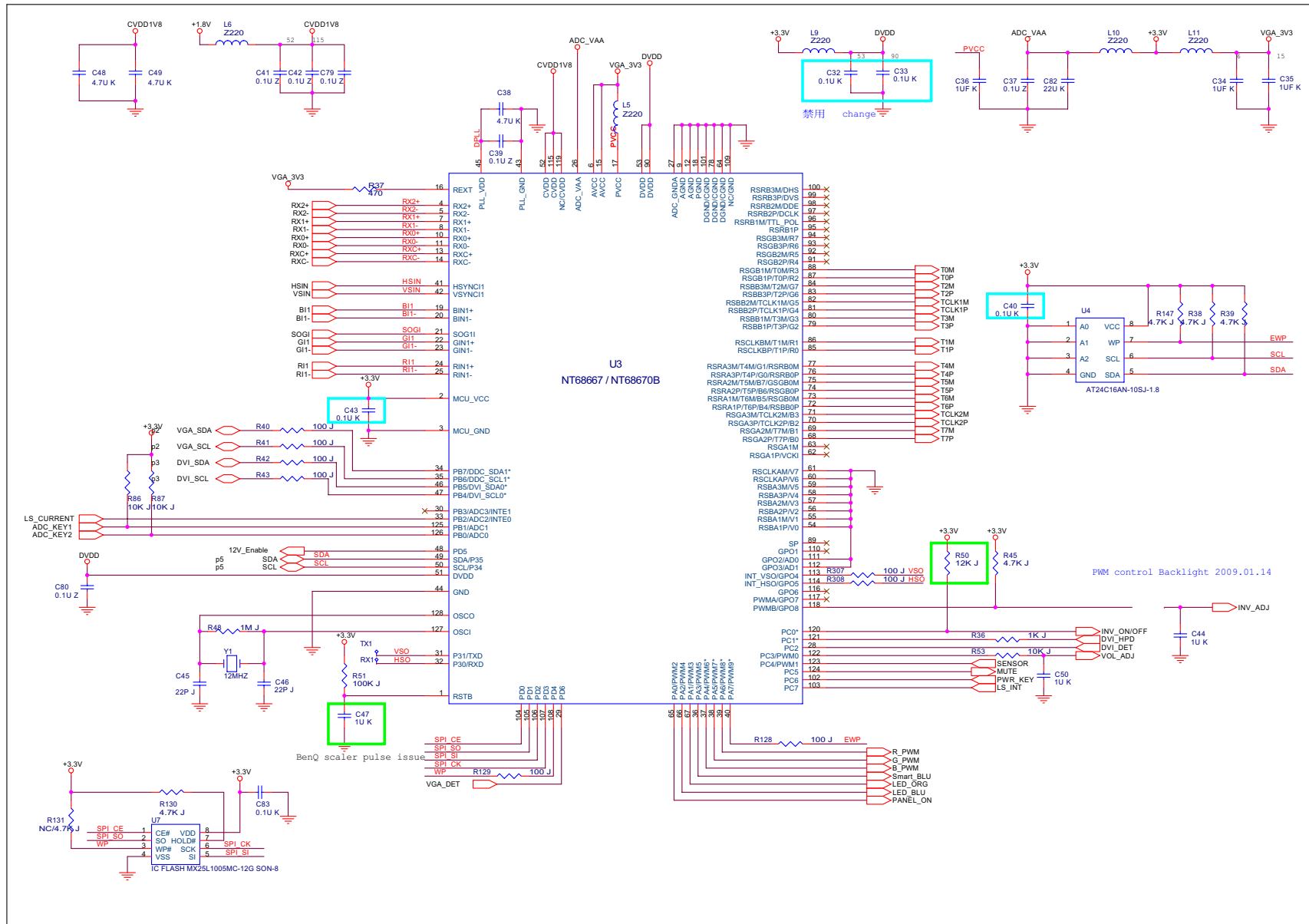
C1	A2
C10	B1
C11	B4
C12	C4
C13	C3
C14	C1
C15	C4
C16	C1
C17	C1
C18	C4
C19	D4
C2	A3
C3	A3
C4	A4
C5	A3
C6	A4
C7	B4
C8	B4
C9	B3
D1	B1
D2	C2
D3	C2
D4	C3
D8	D3
DN1	A2
DN2	A3
DN3	A2
DN4	B2
DN5	B1
J1	A1
L1	A3
L2	B3
L3	C3
Q9	D1
R1	A4
R10	C4
R11	C3
R12	C1
R13	C1
R14	C4
R15	C2
R16	C2
R17	C4
R18	D3
R19	D4
R2	A3
R20	C4
R21	D4
R3	A4
R4	B4
R5	A2
R6	B4
R67	D1
R68	D2
R69	D2
R7	B5
R8	B3
R9	B4
U1	C1

Scalar Diagram & C.B.A



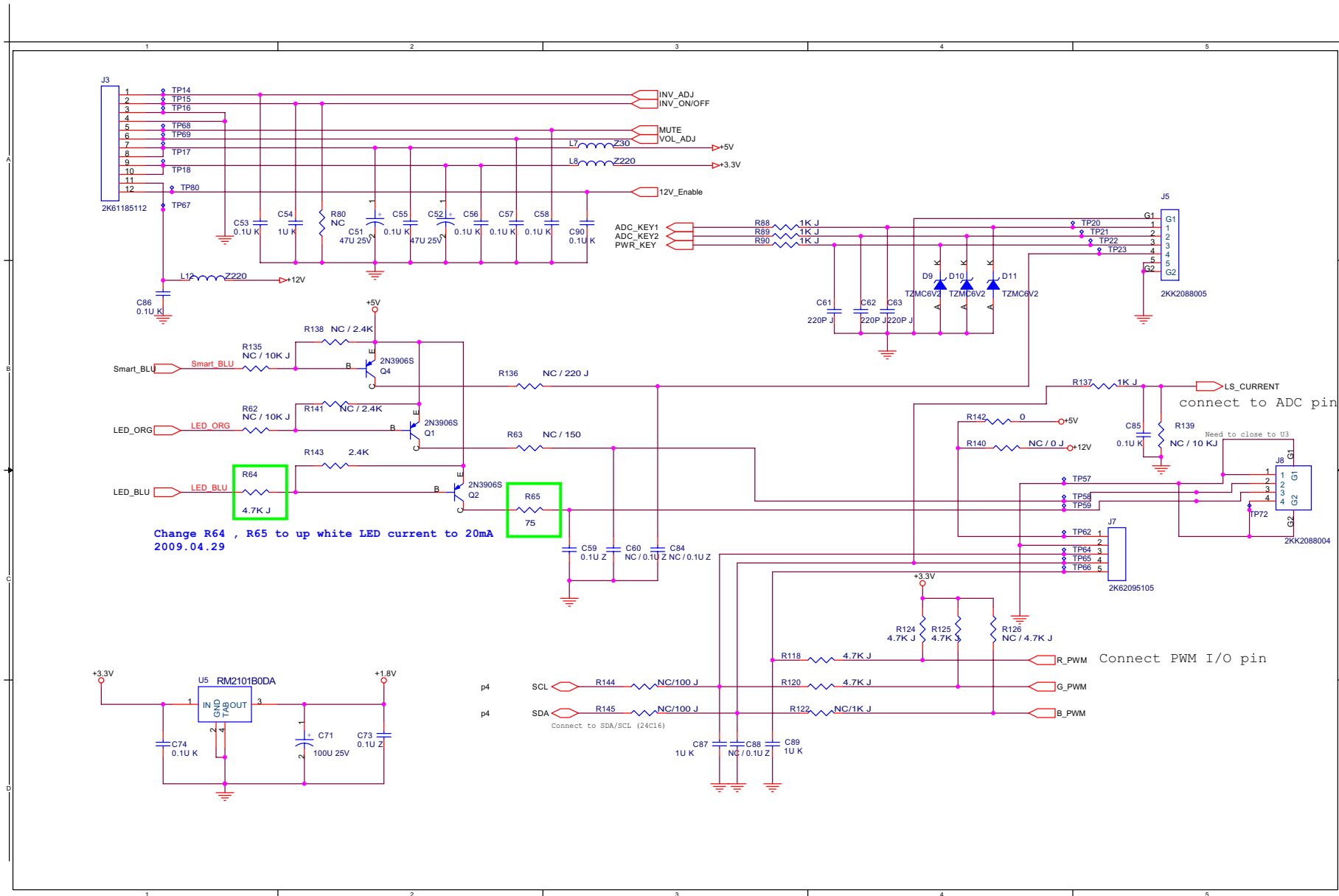
C20	A2
C21	B1
C22	B2
C23	A3
C24	B3
C25	B3
C26	B4
C27	B4
C28	B4
C29	C2
C30	C4
C31	C4
D5	C1
D6	C2
D7	C2
DN10	B4
DN11	B4
DN12	C2
DN13	B4
DN14	C4
DN15	C4
DN6	A2
DN7	A3
DN8	B3
DN9	B4
J2	B1
R22	A1
R23	A2
R24	A1
R25	B1
R26	B5
R27	B2
R28	B5
R29	B5
R30	B5
R304	D2
R306	B2
R31	B5
R32	B5
R33	C2
R34	C5
R35	C5
R81	A2
U2	A2

Scalar Diagram & C.B.A



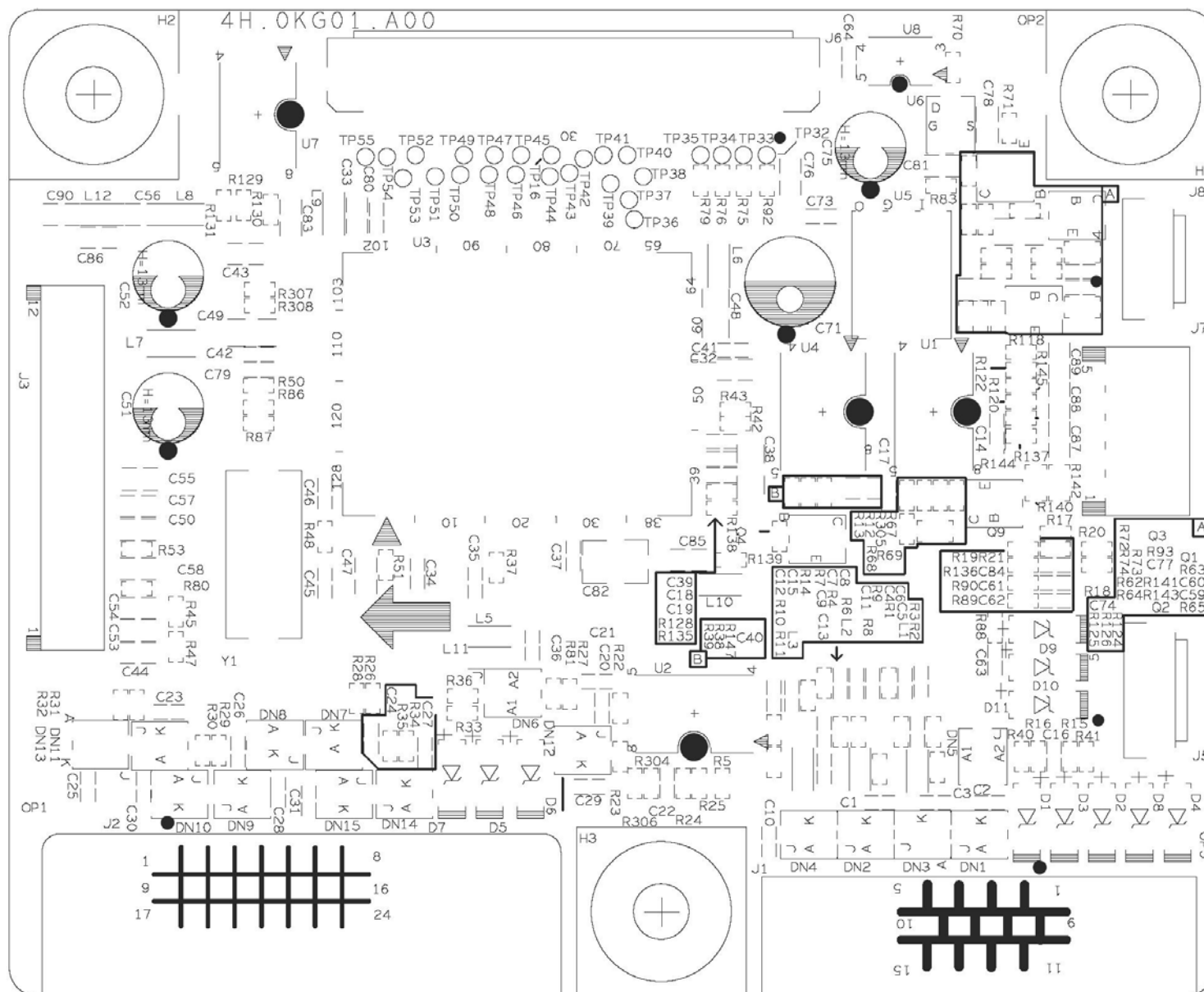
C32	A4
C33	A4
C34	A5
C35	A5
C36	A4
C37	A4
C38	A2
C39	A2
C40	B4
C41	A2
C42	A2
C43	B2
C45	C1
C46	C1
C47	D2
C48	A1
C49	A1
C50	C4
C79	A2
C80	C1
C82	A4
C83	D1
L10	A5
L11	A5
L5	A3
L6	A1
L9	A4
R128	D3
R129	D2
R130	D1
R147	B5
R307	C4
R308	C4
R36	C4
R37	A2
R38	B5
R39	B5
R40	B2
R41	B2
R42	B2
R43	C2
R45	C4
R47	C5
R48	C1
R50	C4
R51	C2
R53	C4
R86	C1
R87	C1
U3	A2
U4	B5
U7	D1
Y1	C1

Scalar Diagram & C.B.A



C51	A2
C52	A2
C53	A1
C55	A2
C56	A2
C57	A2
C58	A2
C59	B2
C61	A3
C62	A3
C63	A3
C71	C1
C73	C2
C74	C1
D10	A4
D11	A4
D9	A4
J3	A1
J5	A4
J8	B5
L7	A2
L8	A2
Q2	B2
R143	B2
R64	B1
R65	B2
R88	A3
R89	A3
R90	A3
U5	C1

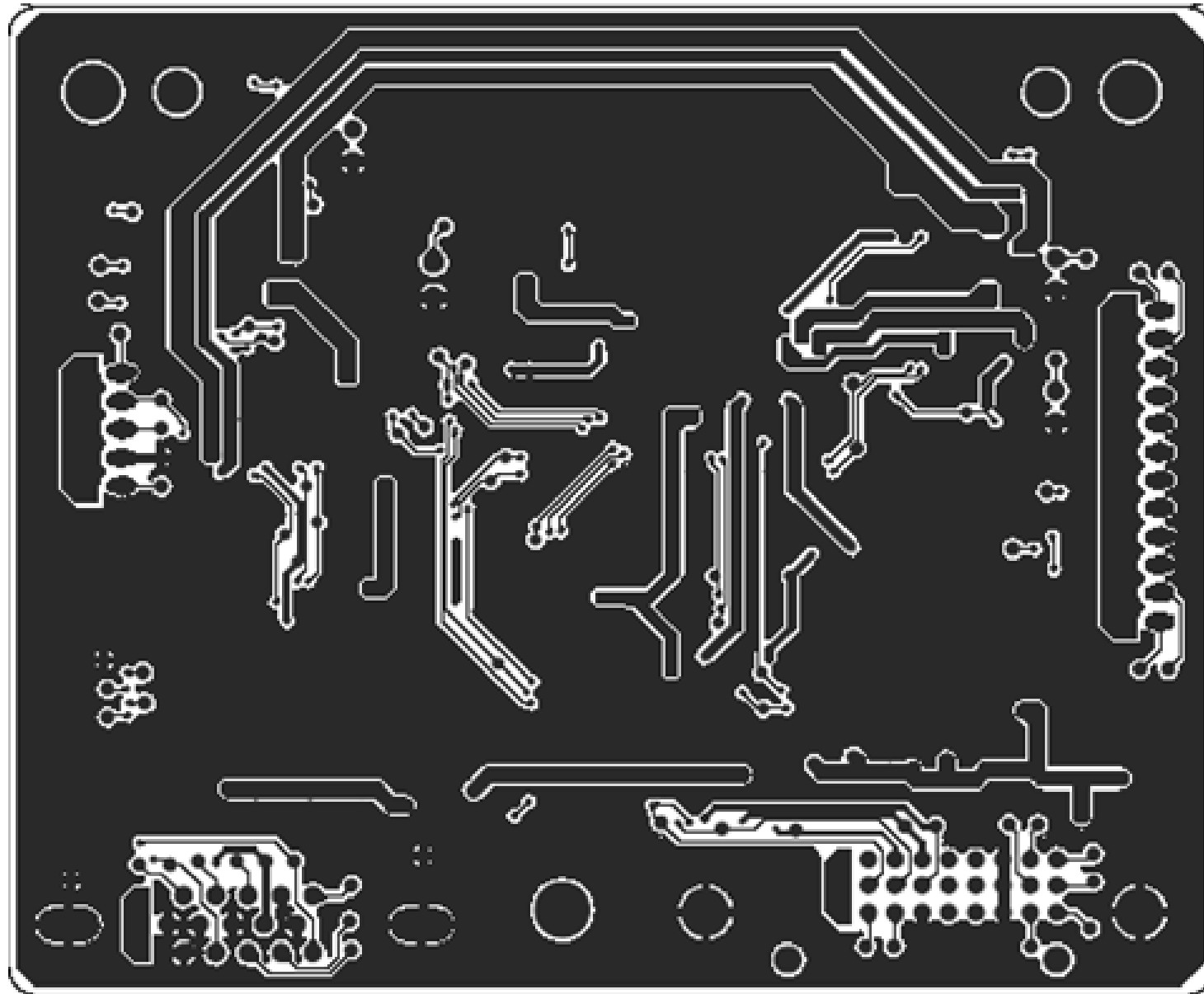
Scalar Diagram & C.B.A.



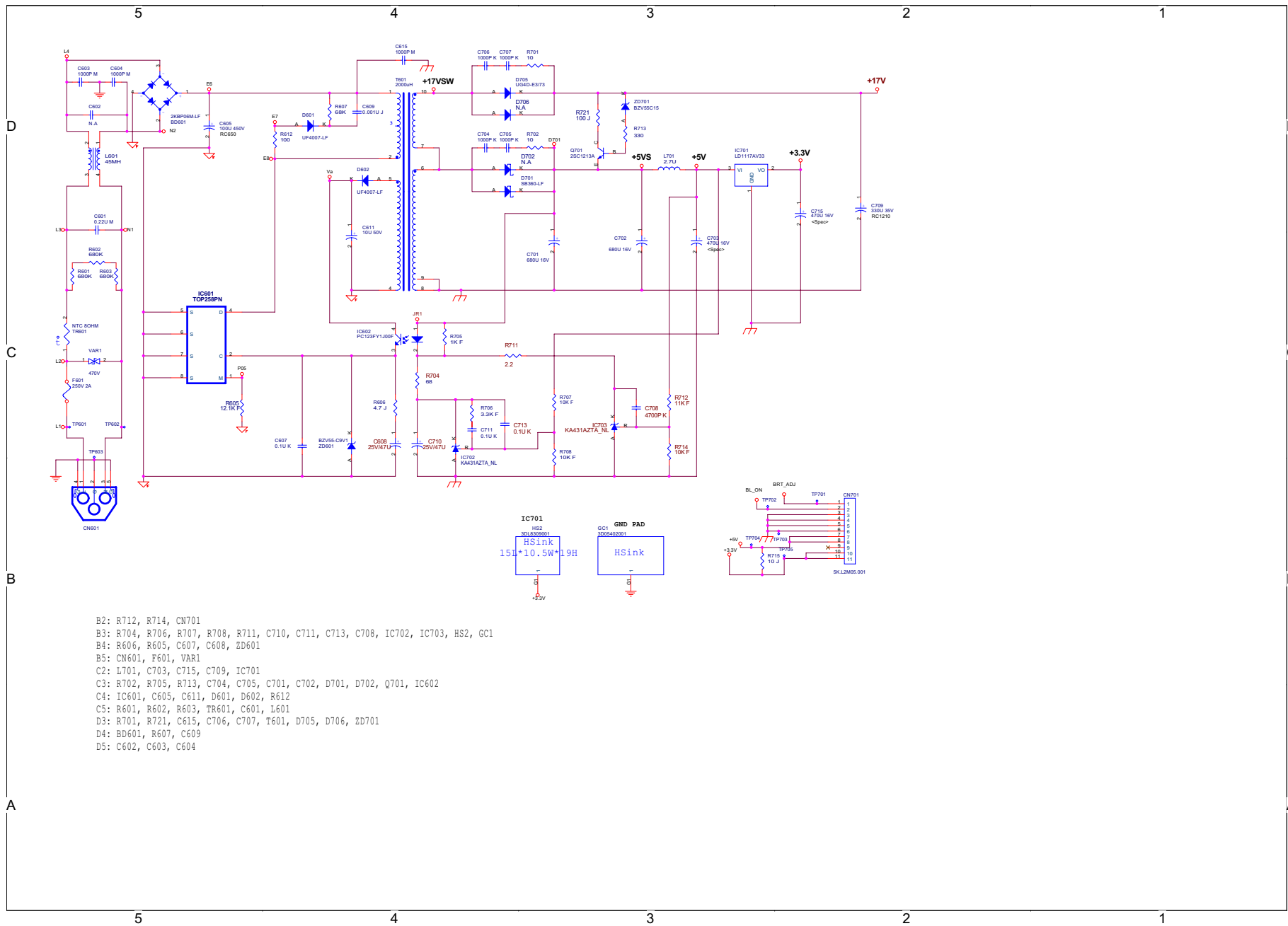
B 3 : C 3 3

B 3 : C 3 3

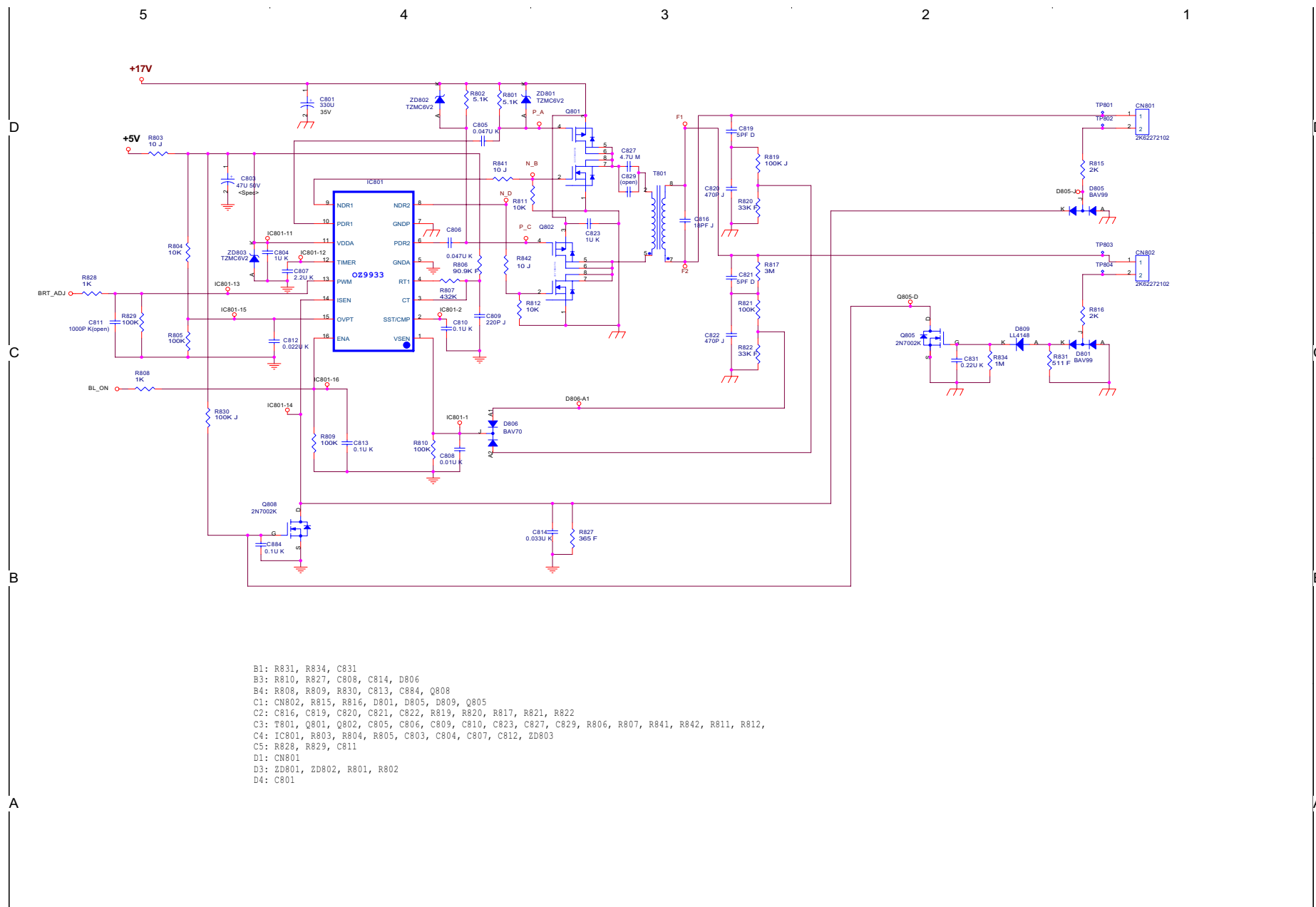
Scalar Diagram & C.B.A.



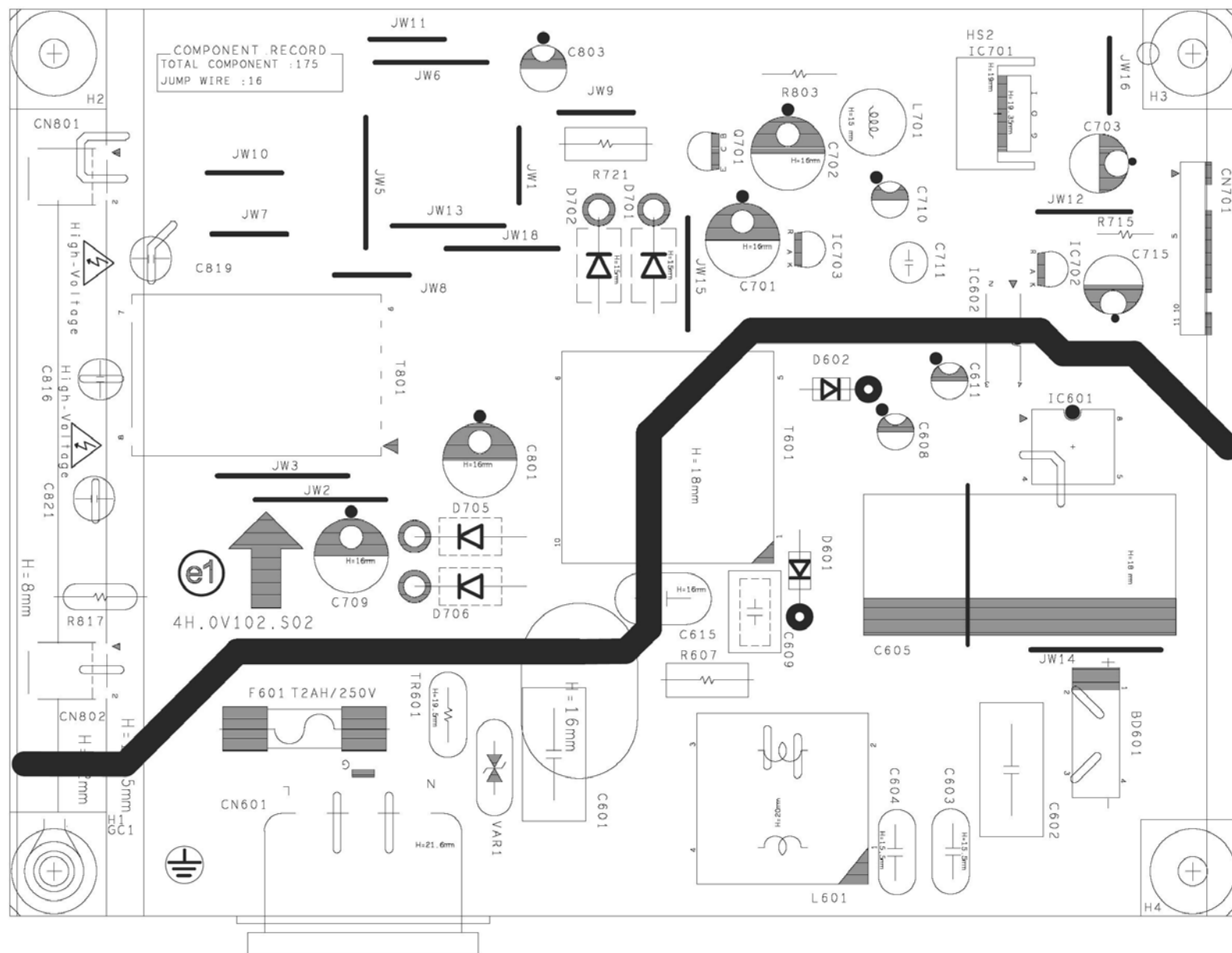
Power Diagram & C.B.A



Power Diagram & C.B.A

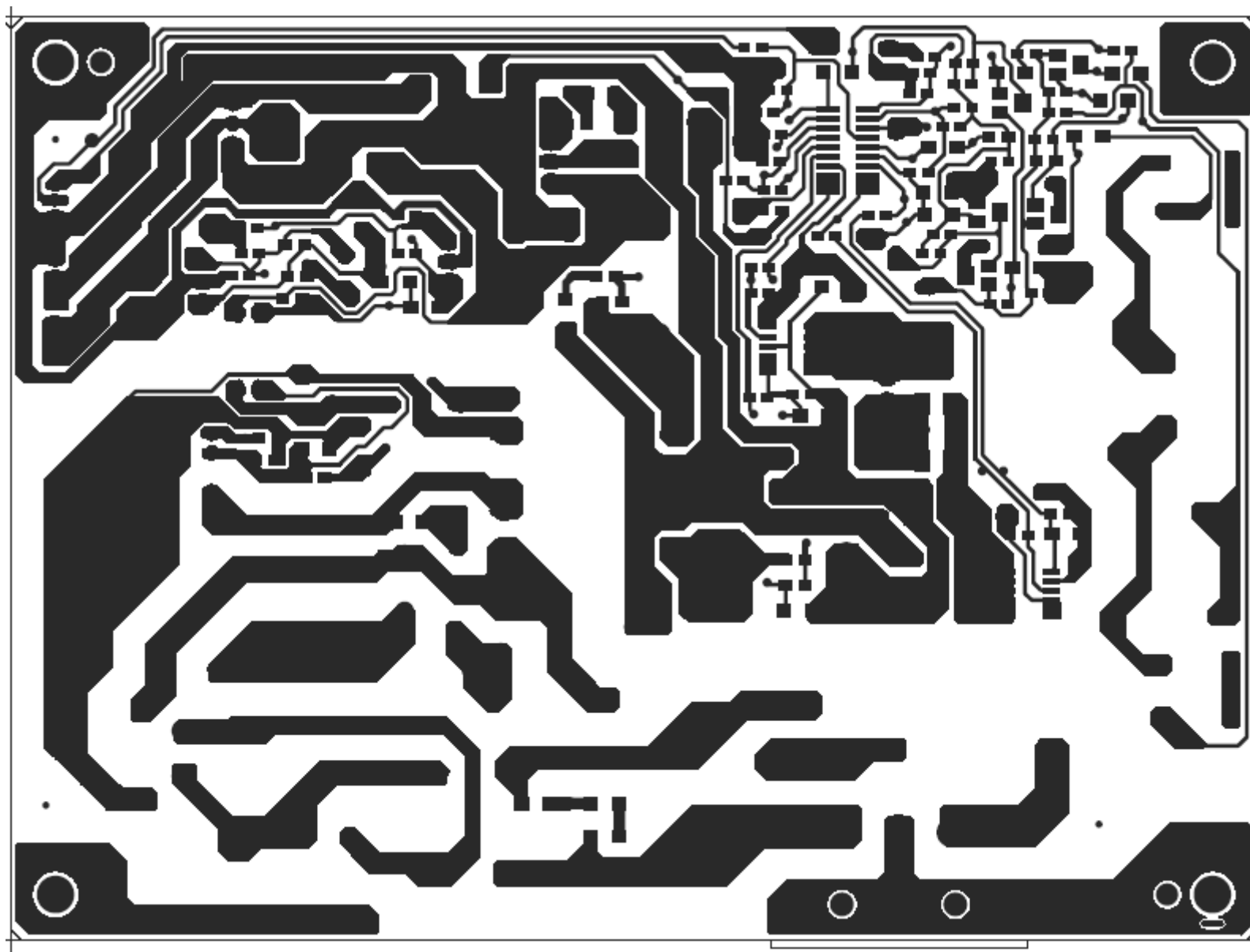


Power Diagram & C.B.A

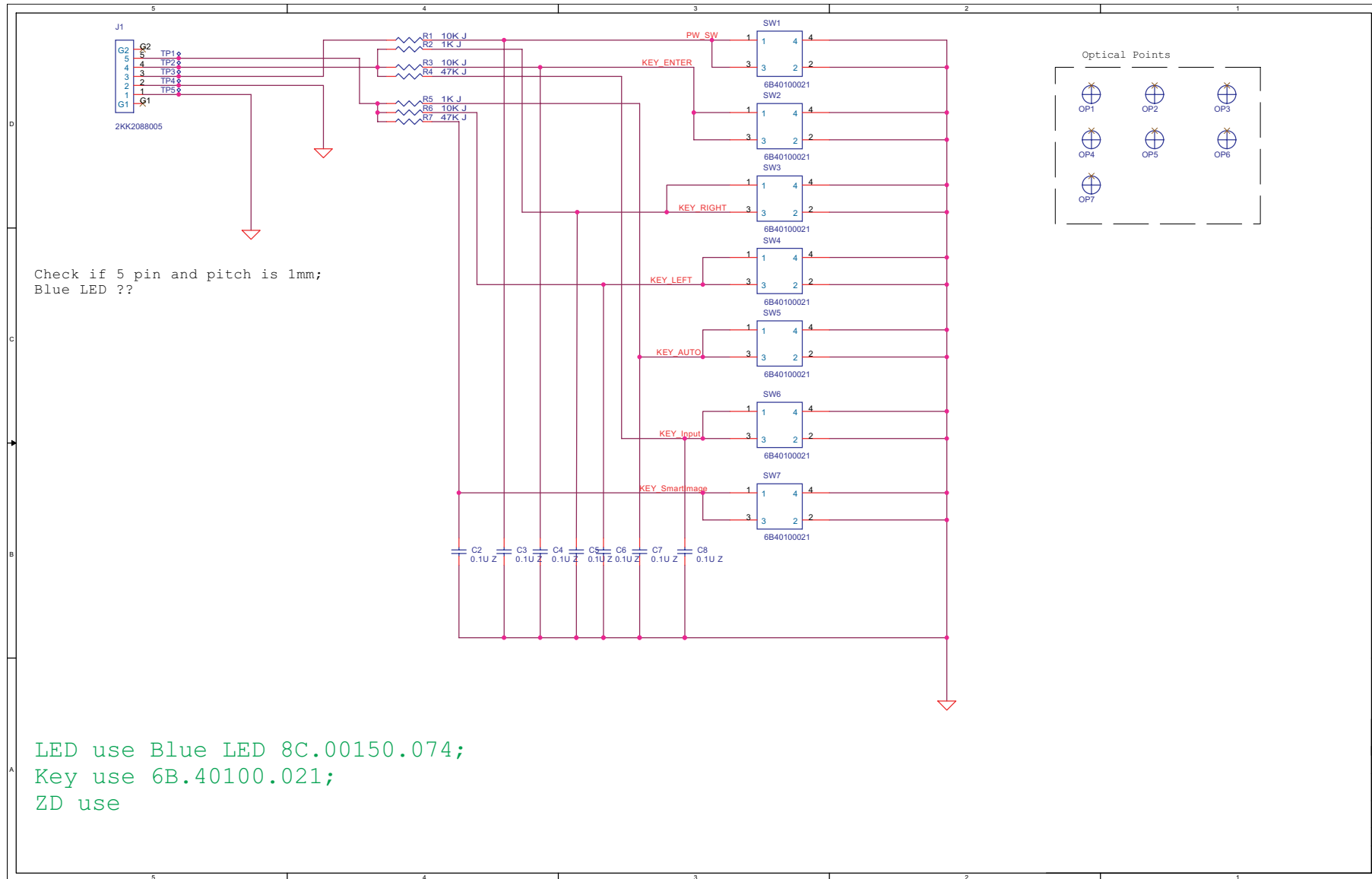


C3:	T601	A1:	BD601
C3:	JW15	A2:	C604
C3:	IC703	A2:	C603
C3:	D701	A2:	C602
C3:	C701	A3:	L601
C4:	JW18	A4:	VAR1
C4:	D702	A4:	TR601
C5:	T801	A4:	C601
C5:	JW8	A5:	F601
C5:	JW5	A5:	CN601
C6:	C819	A6:	GC1
C6:	C816	B2:	JW14
D1:	R715	B2:	C605
D1:	C703	B3:	R607
D1:	JW16	B3:	D601
D1:	JW12	B3:	C615
D1:	CN701	B3:	C609
D2:	R803	B4:	D706
D2:	L701	B4:	D705
D2:	IC701	B4:	C801
D2:	C710	B5:	JW3
D3:	Q701	B5:	JW2
D3:	JW9	B5:	C709
D3:	C702	B6:	R817
D4:	R721	B6:	CN802
D4:	JW11	B6:	C821
D4:	JW1	C1:	C715
D4:	C803	C1:	IC702
D5:	JW7	C1:	IC601
D5:	JW6	C2:	IC602
D5:	JW13	C2:	D602
D6:	JW10	C2:	C711
D6:	CN801	C2:	C611
		C2:	C608

Power Diagram & C.B.A

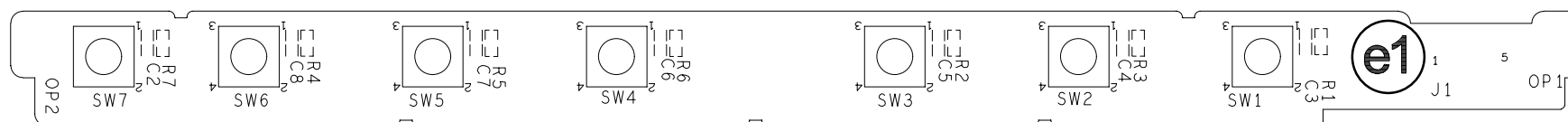


Control Diagram & C.B.A.

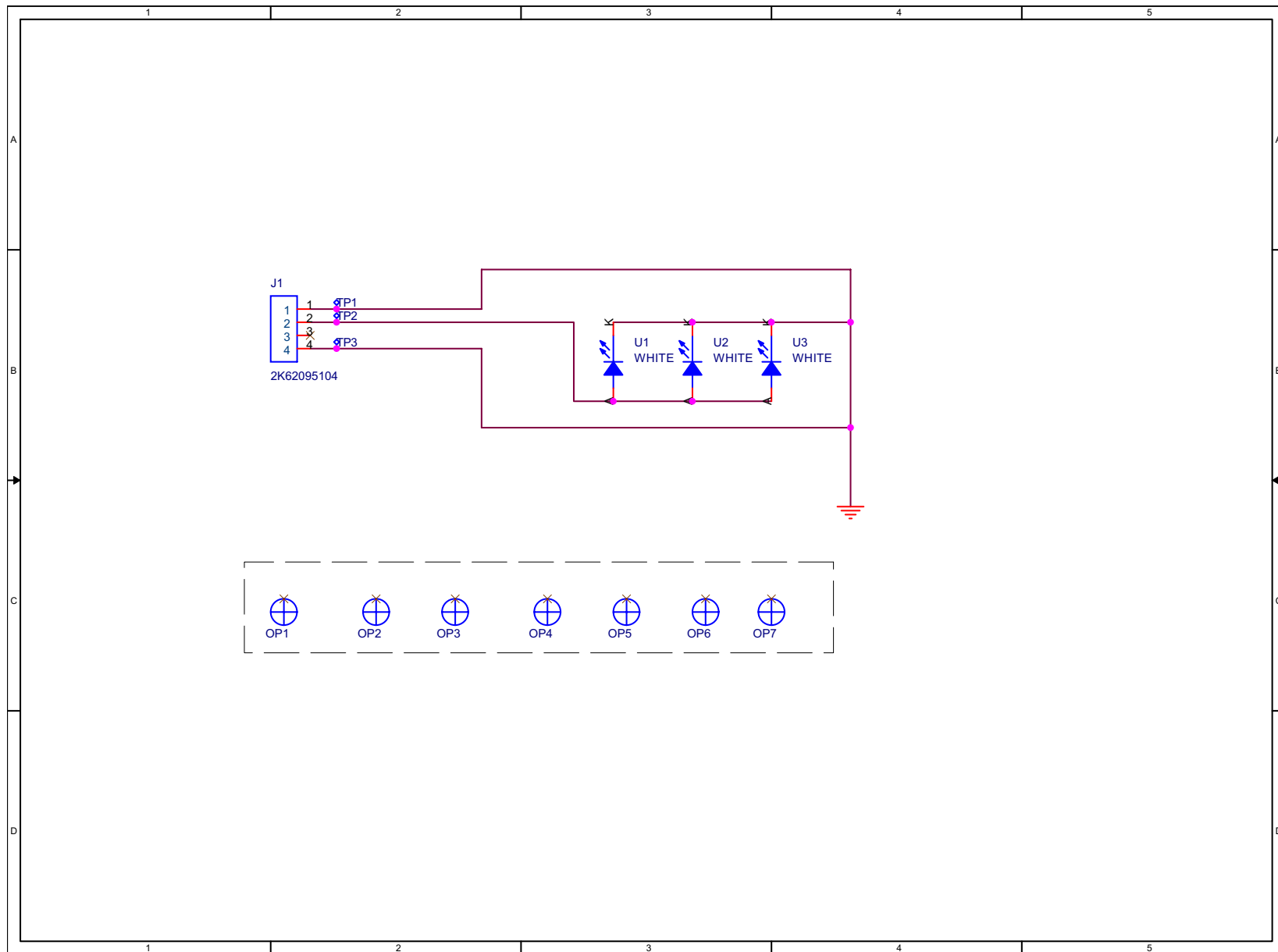


R1	D4
R3	D4
R6	D4
R2	D4
R5	D4
R4	D4
R7	D4
SW1	D3
SW2	D3
SW3	D3
SW4	C3
SW5	C3
SW6	C3
SW7	C3

Control Diagram & C.B .A.

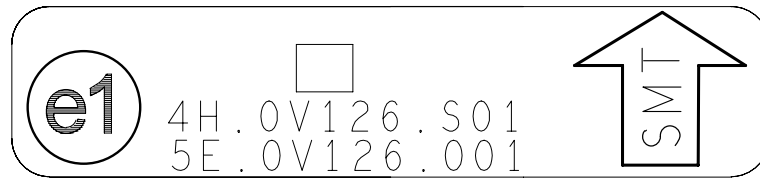


LED Diagram & C.B.A

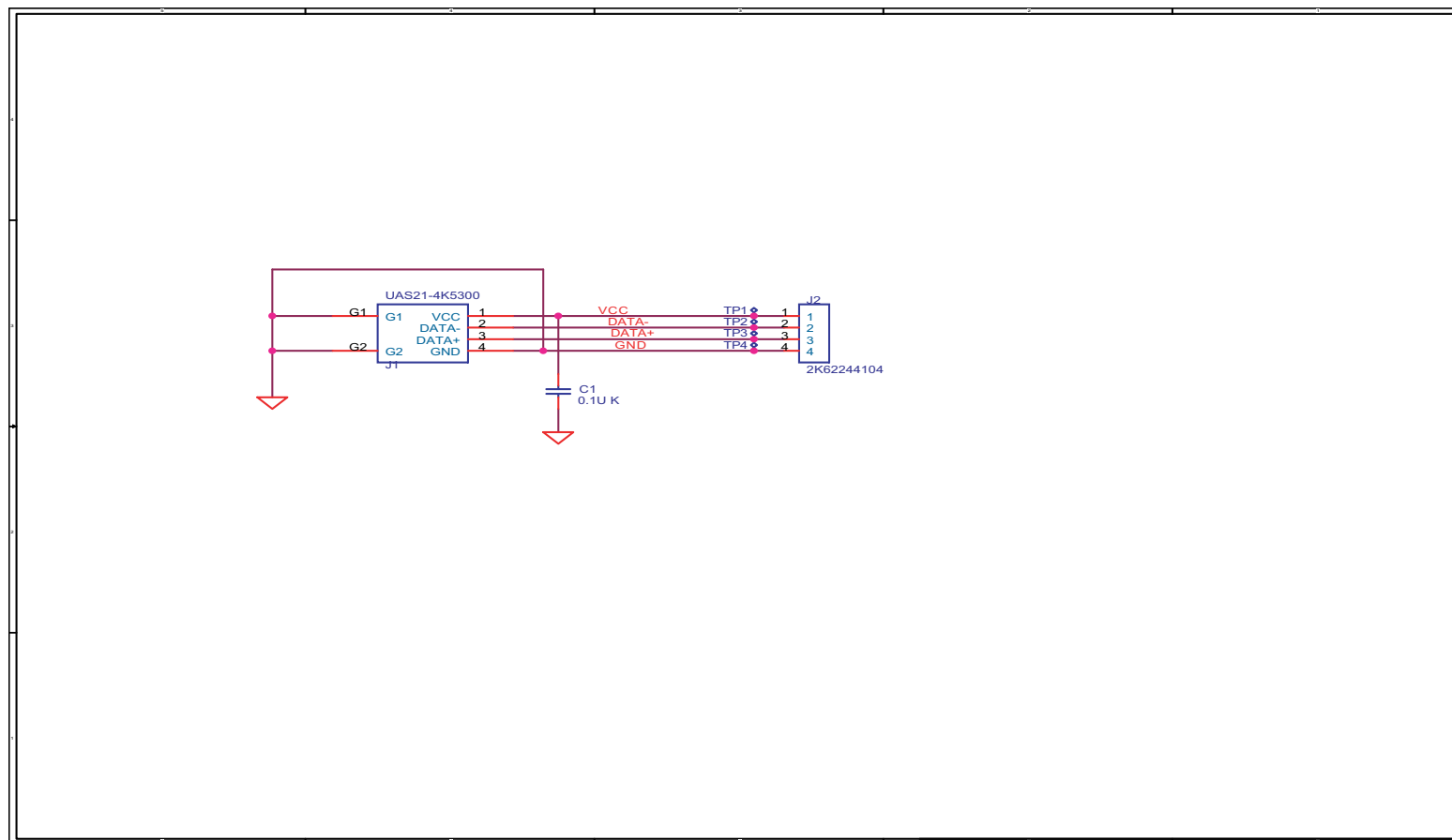


J1	B2
U1	B3
U2	B3
U3	B4

LED Diagram & C.B .A



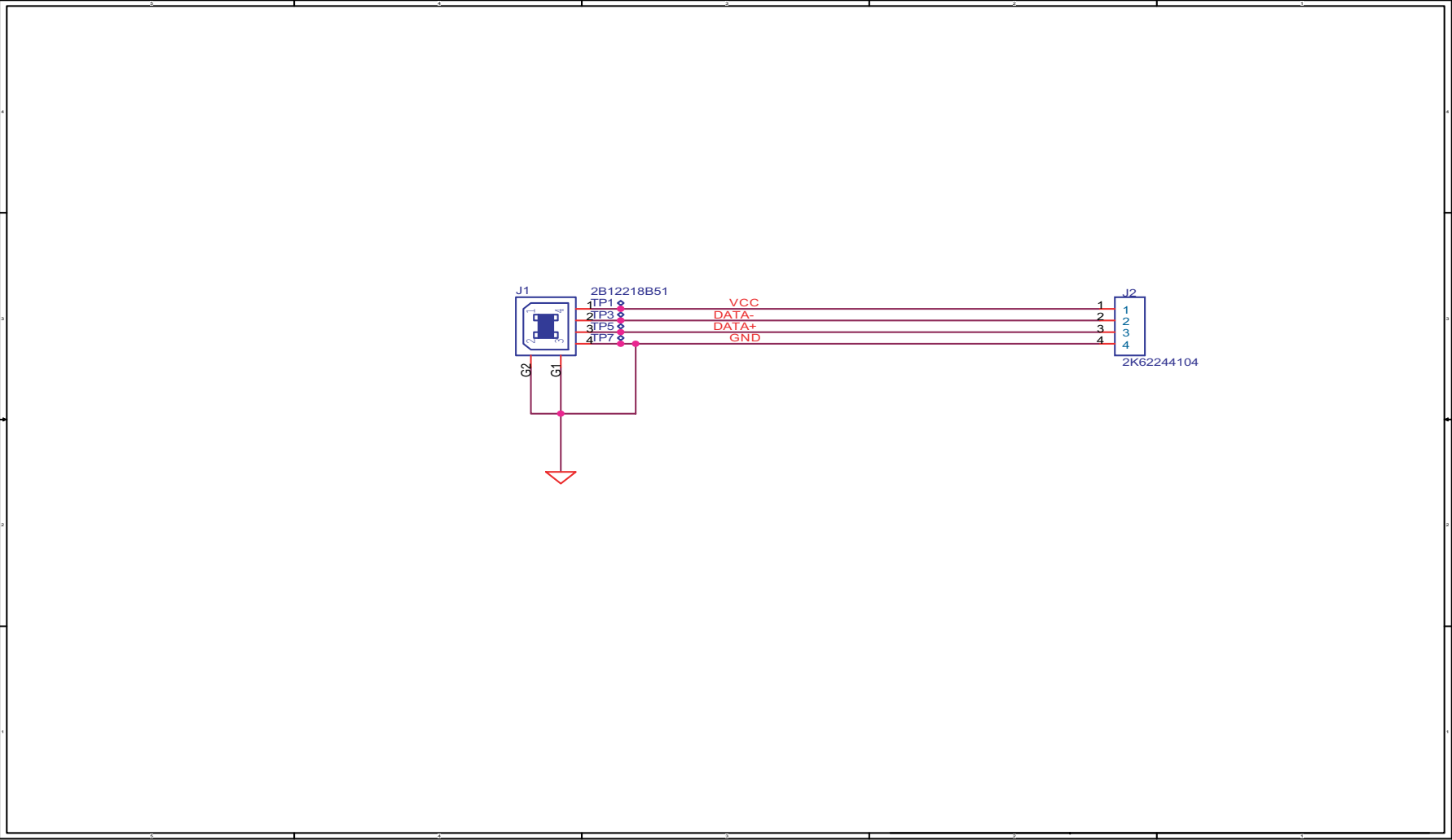
USB Diagram & C.B.A.



J1
J2

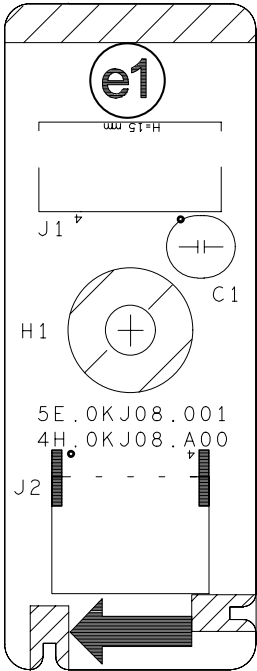
B2
B3

USB Diagram & C.B.A.

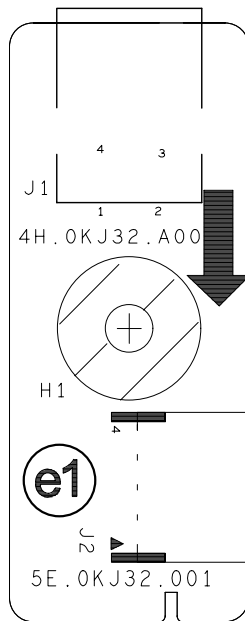


J1 B2
J2 B4

USB Diagram & C.B.A



USB Diagram & C.B.A



General Product Specification

Meridian 1-190C1 GENERAL PRODUCT SPECIFICATION

Issued by: Paul Tsai/Argent Chan

Revision History

Ver.	Date (yy.mm.dd)	Author	Brief Description
0.1	2007.01.25	UC	Initiate version
0.2	2008.04.22	Paul	1) Update H9 timing table 2) Add BLUE Led blinking for standby mode 3) Modify sec 3.3.3 OSD behaviors
0.3	2008 Jul 21	Argent	Updated ME request
1.0	2008.08.05	UC Hsu	Release for PVT Exit
1.1	2008/09/09	Paul	Update video dot rate data
0.1	2009/4/27		Change to Meridian 1-190C1

Blue : changes in this version

Red : open/reminding

General Product Specification

- . ANALOG AND DIGITAL DUAL INPUT
- . AUTO PICTURE ADJUSTMENT
- . 13 FACTORY PRESET MODES AND 50PRESET MODES WHICH CAN BE RECOVERED TO PRESET MODES, 12 USER MODES
- . USER FRIENDLY OSD DISPLAY FOR MODE IDENTIFICATION /ADJUSTMENT
- . MAX. RESOLUTION 1440*900 NON-INTERLACED AT 76 HZ
- . 19" WIDE COLOR TFT LCD FLAT PANEL
- . FULL RANGE POWER SUPPLY 90 – 264 VAC
- . CE ENVIRONMENTAL POLICY
- . ANTI-GLARE TO REDUCE LIGHT REFLECTION
- . POWER MANAGEMENT CAPABILITY
- . SOG SUPPORT
- .Windows Vista Premium Logo Certification for Dual models
Windows Vista Basic Logo Certification for Analog models.
- .HDCP support for DVI input products
- . USB PLUG SUPPORT
- . SMART CONTRAST & SMART IMAGE & SMART RESPONSE (OVER DRIVE)
SMARTContrast: > 30000:1(Typical) [SI to input exact measurement value](#)
- .SMART CONTROL & SMART MANAGEMENT REQUIREMENT
- .TrueVision™ (formerly PerfectTuneII or FGA, FACTORY GAMMA ALIGNMENT)
- .WEEE REQUIREMENT
- .RoHS REQUIREMENT
- .[TCO 5.0](#) REQUIREMENT.

General Product Specification

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General Product Specification

1 FOREWORD

This specification describes a 19" WXGA multi-scan color TFT LCD monitor with maximum resolution up to 1440*900 /75 Hz non-interlaced.

All optical characteristics (including WHITE-D, Brightness, and so on) are determined according to panel specification after warming up approximate 30 minutes that brightness stability is optimal, and follow strictly after panel specification.

2 PRODUCT PROFILE

This display monitor unit is a color display monitor enclosed in PHILIPS styling cabinet which has an integrated tilt base.

2.1 LCD

Panel 1

SEC

Type NR. : LTM190BT03
 Resolution : 1400x900 (WXGA+)
 Outside dimensions : 428 (H) x 278(V) x 17.5(D) mm (Typ.)
 Pitch (mm) : 0.2835mm x 0.2835mm
 Color pixel arrangement : 14400 horiz. By 900 vert. Pixels RGB strip arrangement

Display surface : Hard coating(3H) & Anti-glare treatment of the front polarizer
 Color depth : 16.7M colors
 Backlight : 2 CCFL
 Active area (W x H) : 408.24mm x 255.15mm
 View angle (CR>10) : >=160/160 for H/V (Typ)
 Contrast ratio : >=1000:1 (Typ)
 White luminance : >=300 nit (Typ)
 Color gamut : >=72%
 Source IC : LDI, NEC
 Response time : <=5 ms (Typ)
 Vertical frequency range : 56~76Hz

General Product Specification

Panel 2

LGD

Type NR.	: LM190WX1-TLL1
Resolution	: 1440x900 (WXGA+)
Outside dimensions	: 428.0 (H) x 278.0 (V) x 14.5 (D) mm (Typ)
Pitch (mm)	: 0.2835(H) x 0.2835(V)
Color pixel arrangement	: RGB vertical stripe
Display surface	: Anti-glare type, Hardness 3H
Color depth	: 16.7M colors
Backlight	: 2 CCFL
Active area (W x H)	: 408.24mm x 255.15mm
View angle (CR>10)	: >=170/160 for H/V (Typ)
Contrast ratio	: >=1000:1 (Typ)
White luminance	: >=250 nit (Typ)
Color gamut	: >=72%
Gate IC	:
Source IC	:
Response time	: <=5 ms (Typ)
Vertical frequency range	: 56~76Hz

Panel 3

CMO

Type NR.	: M190A1-L0G
Resolution	: 1400x900 (WXGA+)
Outside dimensions	: 428 (H) x 278(V) x 16.2(D) mm (Typ.)
Pitch (mm)	: 0.2835mm x 0.2835mm
Color pixel arrangement	: 14400 horiz. By 900 vert. Pixels RGB strip arrangement
Display surface	: Hard coating(3H) & Anti-glare treatment of the front polarizer
Color depth	: 16.7M colors
Backlight	: 2 CCFL
Active area (W x H)	: 408.24mm x 255.15mm
View angle (CR>10)	: >=170/160 for H/V (Typ)
Contrast ratio	: >=1000:1 (Typ)
White luminance	: >=250 nit (Typ)
Color gamut	: >=72%
Gate IC	:
Source IC	:
Response time	: <=5 ms (Typ)
Vertical frequency range	: 56~76Hz

General Product Specification

2.2 Scanning frequencies

Hor.	: 30 – 83 K Hz
Ver.	: 56 - 76 Hz
Video dot rate	: < 137 MHz
Power input	: 90-264 V AC, 50/60 $\pm$ 2 Hz
Power consumption	: < 36 W (Typ.) < 42 W (Max.)

Functions:

- (1) D-SUB analog R/G/B separate inputs, H/V sync separated, Composite (H+V) TTL level, SOG sync
- (2) DVI digital Panel Link TMDS inputs

2.3 Ambient temperature: 0 °C - 40 °C

3 Electrical characteristics

3.1 Interface signals

1). D-Sub Analog

Input signal: Video, Hsync., Vsync

Video: 0.7 Vp-p, input impedance, 75 ohm @DC

Sync.: Separate sync TTL level , input impedance 2.2k ohm terminate

Hsync Positive/Negative

Vsync Positive/Negative

Composite sync TTL level, input impedance 2.2k ohm terminate

(Positive/Negative)

Sync on green video 0.3 Vp-p Negative (Video 0.7 Vp-p Positive)

2). DVI-D Digital

Input signal: Single TMDS link (Three channels: RX0-/+, RX1-/+, RX2-/+))

3). USB PLUG support

Input signal: Upstream input (V_{BUS} , D+, D-, GND) via USB-B receptacle.

Output signal: Downstream output (V_{BUS} , D+, D-, GND) through USB-A receptacle

General Product Specification

3.2 Interface

3.2.1 D-Sub Cable

Length : 1.8 M +/- 50 mm

Fix with monitor when packing, with transplant pin protective cover.

Connector type : D-Sub male with DDC2B pin assignments.
Blue connector thumb-operated jack screws

Pin assignments:

PIN No.	SIGNAL
1	Red
2	Green/ SOG
3	Blue
4	Sense (GND)
5	Cable Detect (GND)
6	Red GND
7	Green GND
8	Blue GND
9	DDC +3.3V or +5V
10	Logic GND
11	Sense (GND)
12	Bi-directional data
13	H/H+V sync
14	V-sync
15	Data clock

3.2.2 DVI Cable

The input signals are applied to the display through DVI-D cable.

Length : 1.8 M +/- 50 mm

Connector type : DVI-D male with DDC-2B pin assignments
White connector thumb-operated jackscrews

General Product Specification

Pin Assignment:

Pin No.	Description
1	T.M.D.S. data2-
2	T.M.D.S. data2+
3	T.M.D.S. data2 shield
4	No Connect
5	No Connect
6	DDC clock
7	DDC data
8	No Connect
9	T.M.D.S. data1-
10	T.M.D.S. data1+
11	T.M.D.S. data1 shield
12	No Connect
13	No Connect
14	+5V Power
15	Ground (for +5V)
16	Hot plug detect
17	T.M.D.S. data0-
18	T.M.D.S. data0+
19	T.M.D.S. data0 shield
20	No Connect
21	No Connect
22	T.M.D.S clock shield
23	T.M.D.S. clock+
24	T.M.D.S. clock-

3.2.3 USB Cable (High Full Speed) (N/A)

3.2.4 Audio cable (N/A)

3.2.5 HDMI Type A cable pin out (N/A)

3.2.6 S/PDIF output (N/A)

General Product Specification

3.3 Timing requirement

Factory Preset mode definition:

1. Perfect FOS while presenting all required timings.
2. Required timings need to be specified in User's Manual

Preset mode definition:

1. Need to support those timings.
2. Perfect FOS after auto adjustment.

User mode

1. Can save those timing that not in Preset mode and can be showed (not over scalar or Panel spec.)
2. It needs to reserve the 12 timings space in memory size.

3.3.1 Mode storing capacity

Factory preset modes	: 13
Preset modes	: 45
User modes	: 12

- Note:
1. Screen displays perfect picture at 13 factory-preset modes.
 2. Screen displays visible picture with OSD warning when input modes are the 48 preset modes

3.3.2 Factory preset modes

- Factory modes and preset modes are defined in the enclosed timing table file

Please refer to 19W page.



M1 Timing
table_20080511.xls

- Video timing mode (internal firmware support) ,
60Hz: 480p/720p/1080i/1080p
50Hz: 576p/720p/1080i/1080p

(Since Panel Vsync support Frequency is 53 ~ 76 Hz, can't make sure that 50Hz timings are able to display normally, no de-interlace function for interlace video timing.)

General Product Specification

3.3.3 Software control functions via OSD / control adjustable functions:

Please refer to following Hudson9 OSD definitions, if any deviation, then refer to PVT Exit sample.

ITEM			
1	OSD DEFINITIONS	 M1 OSD Definition - v14.doc	Reset - No: Exit Yes: Auto adjustment for displaying timing mode and recall factory preset
2	OSD LANGUAGES	 M1 languages.xls  M1 new item translation _ 2009020	8 LANGUAGES
3	OSD TREE	 Button definition _ 20081126_Office 200	
4	POWER ON LOGO	 19W_1440x900.zip	Power On Logo: Power On → Show up Philips logo 3 seconds → Change to input signal. This picture is reference only. The official drawing will send out by PM.
5	Audio Selection	Stand-alone – On: Isolate video and audio control input Stand-alone – Off: Integrate video and audio control input Mute – On: Turn off audio Mute – Off: Turn on audio	No audio support this model
6	Register information		AC On/DC On register information -> Show register OSD 3 sec -> Only to show first 5 times when AC or DC power on/off -> After reset in OSD, then re-count 5 times again.

General Product Specification

3.4 Horizontal scanning

Sync polarity : Positive or Negative
Scanning frequency : **30 – 83 K Hz**

3.5 Vertical scanning

Sync polarity : Positive or Negative
Scanning frequency : **56 - 76 Hz**

3.6 Power input connection

Power cord length : 1.8 M
Power cord type : 3 leads power cord with protective earth plug.

3.7 Power management (supplier to input)

The monitor must comply with the Microsoft On Now specification, and meet EPA requirements.

Mode	HSYNC	VSYNC	Video	Pwr-cons.	Indication	Rec. time
Power-On	On	On	active	< 36 W typ. < 42 W max.	White LED	--
Standby	Off	Off	blanked	< 0.8 W	Blinking White LED Period: 3sec On, 3sec Off	< 3 s
DC Power Off			N/A	< 0.5 W	LED Off	

*** Energy star report less than 33 watt**

3.8 Display identification

In accordance with VESA Display Channel Standard Ver.1.0 and DDC 2B capability

3.9 Display identification

In accordance with DVI requirement (DDWG digital Visual Interface revision 1.0) use DDC-2B, DDC/CI, and EDID V1.3

General Product Specification

3.10 USB support

Connect the upstream port of the monitor to host PC's USB port via USB cable,
Then attach external device to the downstream port of the monitor.
Check if the device can work properly.

3.11 DDC /CI Support

In accordance with VESA DDC/CI and MCCS ver.2.0, the monitor should be workable with
Philips SmartManage lite, SmartControl II, and
Protrait Display Tune at least.

3.12 Data for EDID & INF file

Data for EDID & .inf file

1	User visible strings on .inf file	Philips 190C (19inch WIDE LCD MONITOR 190C1)
2	Manufacturer ID (EDID data)	PHL
3	Product ID, "xxxx" 4 codes	MSB(byte 12): C0
		LSB (byte 11): 37
4	maximum resolution	1440x900
5	Horizontal Frequency Range	30~83 KHz
6	Vertical Frequency Range	56~76Hz
7	Monitor Name (13 characters max.)	Philips 190C

3.13 Hot-key definition



Hot key operation for
Meridian 1 Monitors.x

Any deviation between document and sample, please refer to Philips approved sample.

3.14 Smart contrast (Dynamic contrast ratio)

Smart Contrast is a kind of dynamic backlight control.

This function changes

the panel backlight dynamically according to the frame brightness histogram.

At least the minimum contrast ratio has to be > 30000:1.

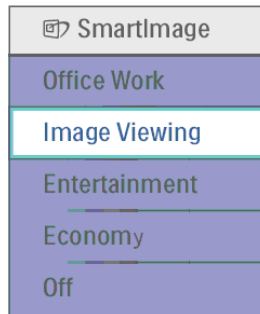
General Product Specification

3.15 Smart response (over drive)

Response time < 2msec GtG

3.16 Smart image

3.16.1 Smart Image OSD outlook



3.16.1.1 Position

Pressing the "Smart Image" button, the position is in the bottom center of the screen.

3.16.1.2 Smart Image Logo & Banner

As design to keep the LightFrame logo at header but change the name to "SmartImage" with bitmap format.

3.16.1.3 Icon of each profile

Each profile will use text instead of icon & text before.

3.16.1.4 User Operation Procedure

- A. 5 different modes are switched to next in the sequence from 1 to 5 then back to 1 while pressing this button: 1) Office Work 2) Image Viewing 3) Entertainment 4) Economic 5) Off. The default setting is 'Off'.
- B. The FOS optimization will be changed in real time by which profile to be scrolled, users don't need to confirm to enable.
- C. The Smart Image OSD will remain on screen for 5 seconds after user last action. Or user can also press [MENU] to close the Smart Image OSD immediately.
- D. Except using [MENU] button to scroll down profile. If Smart Image OSD already launched onscreen. User is allowed to use up/down key to choose profile and press [MENU] to confirm selection and close the Smart Image OSD.
- E. If the model has multiple inputs including VGA and DVI, each input has their own set of

General Product Specification

profiles. When user switch input, the profile to be applied will also change.

F. Each input can memorize their individual “Smart Image” profile status.

For example, Smart Image is on with “Office” profile at VGA input, when switch to DVI input, the Smart Image will revert to previous profile of DVI.

In the input switching process the “Smart Image” OSD will also show up to present which profile is selected if “Smart Image” is enabled at that input.

The Smart Image status will also be stored after the monitor is resumed from AC on/off or power switch on/off.

3.16.1.5 Linkage between Smart Image OSD and main OSD

A. Settings within main OSD have linkage with Smart Image OSD.

- i. Brightness
- ii. Contrast
- iii. Color Temperature

B. Because each preset profiles will define default setting of these 3 parameters. Users can understand what is the value of that in preset profile by open the main OSD.

C. When any SmartImage Lite profile had been enabled. The parameters in main OSD are still available for user to adjust. But these adjustments are temporary only. If users switch to another profile and then go back. The setting in main OSD will show preset values of that SmartImage profile enabled.

3.16.1.6 Profile Definitions (supplier to input at design stages)

A. Office Work

- i. Purpose: Design for general office application, like word processing, Spreadsheet and email. The screen is dominated by text.
- ii. Enhancement point:
 - 1. A little sharpness for increasing the details of e.g. an excel grid.
No other type of enhancement as it won't bring value.
 - 2. Color temperature remains in 6500°K.
 - 3. Brightness level should be 70%.

General Product Specification

4. Smart Response set to "Off".
5. Smart Contrast set to "Off".

B. Image Viewing

- i. Purpose: Design for image viewing application, especially in slide show. The screen is dominated by picture. Powerpoint presentation could use this profile also.
- ii. Enhancement Point:
 1. Dynamic contrast enhancement by histogram analysis (DLC) should be off.
 2. Sharpness and color to be enhanced 75%.
 3. Color temperature 6500°K (or even 5500°K, but it should be checked against the light output)
 4. Brightness level sets to maximum.
 5. Smart Response set to "Off".
 6. Smart Contrast set to "Off".

C. Entertainment

- i. Purpose: Design for video application, Like Microsoft Media Player or Real Player. The screen is dominated by video.
- ii. Enhancement Point:
 1. Dynamic contrast enhancement by histogram analysis (DLC) should be implemented.
 2. Sharpness enhanced 90%.
 3. Color enhancement set as the same with Video.
 4. Color temperature set to 7500K.
 5. Brightness level sets to maximum.
 6. SmartResponse set to "On "
 7. Gamma Table turn off to achieve fastest response time.
 8. Smart Contrast set to "On"
 9. Gamms set to 2.4

D. Economy

- i. Purpose: Adjust brightness level for reducing power consumptions
- ii. No optimization by Smart Image.

General Product Specification

- iii. Design:
 1. Brightness level set to 70%, a little higher brightness level than laptop PC, fine tune brightness level before DVT exit.
 2. Color temperature set to original
 3. Gamma Table is turn on to reduce bad color tracking.

E. Off

- i. Purpose: No optimization by SmartImage.
- ii. Design:
 1. This will follow user OSD setting. If any change by user, it will be saved. When switch back from other SmartImage profiles, it will go back to last saved setting.
 2. Gamma Table is turn on to reduce bad color tracking.

3.16.1.7 Demo mode

- A. Purpose: Built-in demo mode for sales in-store demo.
- B. Design:
 - i. Dynamically split screen to 2 vertical frames with one vertical white line. The line width is 2 pixels. The left frame will be enhanced by SmartImage Lite and right frame remains original performance.
 - ii. There is OSD showing “SmartImage Lite & SmartResponse Demonstration” in left frame and “Original Image” in right frame.
 - iii. The OSD word color is white with transparent background.
 - iv. The demo profile will be “Video Playback” profile with “High” ODC setting.
 - v. The current SmartContrast value also be shown on the bottom of the screen.

C. Hot keys to trigger:

Press [Smart Image] 3 seconds or more to trigger the demo mode.

When demo mode is On, press 3 seconds or more to turn off the demo mode.

Visual characteristics

3.17 Test conditions

Unless otherwise specified, this specification is defined under the following conditions.

- (1) Input signal : As defined in 3.3, 1440*900 non-interlaced mode (1440*900@60Hz 146.25MHz),

General Product Specification

signal sources must have 75 ohm output impedance.

(2) Luminance setting: controls to be set to 300 nits with
full screen 100 % duty cycle white signal

(3) Warm up: more than 30 minutes after power on with signal supplied.

(4) Ambient light: 400 -- 600 lux.

(5) Ambient temperature: 20 ± 5 °C

3.18 Brightness

To follow Panel specification.

3.19 Image size

Actual display size 410.4 x 256.5mm

3.20 Brightness uniformity

Set contrast at 100% and turn the brightness to get average above 300 nits at centre of the screen.

Apply the Fig 1, it should comply with the following formula:

$$\frac{B_{\min}}{B_{\max}} \times 100\% > 75\% \text{ (Follow panel spec.)}$$

Where $B_{\max}$ =Maximum brightness

$B_{\min}$ = Minimum brightness

3.21 Check Cross talk (S)

Apply Pattern 2. Set contrast and brightness at 100 %.

Measure YA. Then output Pattern 3 and measure YB.

the cross talk value :

$$\frac{\text{ABS} (Y_A - Y_B)}{Y_A} \times 100\% < 1.5 \%$$

3.22 Color temperature adjustment

There are six factory preset white color 11500K, 9300K, 8200K, 7500K, 6500K, sRGB, 5000K

Align by Philips PerfectTune (also called FGA) function.

Apply full white pattern, with brightness in 100 % position and the contrast control at 50 % position.

The 1931 CIE Chromaticity (color triangle) diagram (x , y) coordinate for the screen center should be:

General Product Specification

Product specification

CIE coordinates	(x,y)	
11500K	$x = 0.270 \pm 0.02$ $y = 0.281 \pm 0.02$	
9300K	$x = 0.283 \pm 0.02$ $y = 0.297 \pm 0.02$	
8200K	$x = 0.291 \pm 0.02$ $y = 0.306 \pm 0.02$	
7500K	$x = 0.298 \pm 0.02$ $y = 0.314 \pm 0.02$	
6500K/sRGB	$x = 0.313 \pm 0.02$ $y = 0.329 \pm 0.02$	
sRGB	$x = 0.313 \pm 0.02$ $y = 0.329 \pm 0.02$	
5000K	$x = 0.345 \pm 0.02$ $y = 0.357 \pm 0.02$	

Production alignment spec.

CIE coordinates	(x,y)	
11500K	$x = 0.270 \pm 0.006$ $y = 0.281 \pm 0.006$	
9300K	$x = 0.283 \pm 0.006$ $y = 0.297 \pm 0.006$	
8200K	$x = 0.291 \pm 0.006$ $y = 0.306 \pm 0.006$	
7500K	$x = 0.298 \pm 0.006$ $y = 0.314 \pm 0.006$	
6500K/sRGB	$x = 0.313 \pm 0.006$ $y = 0.329 \pm 0.006$	
sRGB	$x = 0.313 \pm 0.006$ $y = 0.329 \pm 0.006$	
5000K	$x = 0.345 \pm 0.006$ $y = 0.357 \pm 0.006$	

Quality Inspection specification:

CIE coordinates	(x,y)	
9300K	$x = 0.283 \pm 0.015$ $y = 0.297 \pm 0.015$	
6500K/sRGB	$x = 0.313 \pm 0.015$ $y = 0.329 \pm 0.015$	
sRGB	$x = 0.313 \pm 0.015$ $y = 0.329 \pm 0.015$	

General Product Specification

4 Mechanical characteristics

4.1 Cosmetic -

Philips ID

4.2 Mechanical data files -

ProE files required

4.3 Location of Philips logo -

Per Philips make-up sheet

4.4 Gap between panel and front bezel

< 1.0 mm

4.5 Location of Control icons -

Per Philips Graphic sheet

4.6 Color for resin/paint -

Per Philips make-up sheet

4.7 Fire enclosure request-

Shielding Cover should fulfill international standard

4.8 Resins

- RoHS required
- WEEE required.
- Resin type/selection refer to Project Book Section 7.2 Plastic material.

4.9 If paint is used

- RoHS required
- WEEE require
- If new painting type need to implement, refer to UN-D 1235.

4.10 Plastic mold tooling

- Tooling to be designed to minimize cosmetic defects induced by molding process (sink, blush, weld lines, gate marks, ejector marks, etc.). Refer to "TYV61-90007".
- Painting to cover up cosmetic defects due to molding is strongly discouraged.

General Product Specification

- China RoHS mark requested.

4.11 Plastics flammability

- All Plastics to be Flame Retardant UL 94-HB or Better.
- Base / Pedestal to be Flame Retardant UL 94-HB.
- All major plastic parts (bezel, back cover) need to be molded from same resin.
- Plastic resin type selection should be referred to “plastic-Philips Pool monitor”.

4.12 Texture/Glossing of housing

- The texture area and texture no should follow Philips make-up sheet.
- The exterior surfaces shall have a uniform texture.
- Philips must approve the mold texturing.
- Detail document for texture refer to “UN-D249”, “UN-D 600”.
- ≥ 80 gloss units

4.13 Tilt and swivel base

- Tilt angle : $-5^{\circ} +2/-0^{\circ}$ (forward)
 $+20^{\circ} +3/-0^{\circ}$ (backward)
- Swivel angle : nil
- High Adjustment : nil
- Portrait Display : nil

4.14 Kensington Lock

- Must meet Kensington_slot.spec “TYE-M0004”.
- MMD request metal plate in Kensington hole.

4.15 Label

- Regulatory label / Carton label should follow Philips requirement.
- China RoHS label.
- Detail document refer to Philips Engineering Reference Book.

General Product Specification

4.16 Product dimension / Weight ((Refer to Philips approved SHT 191/SHT560))

- Unit dimension : 443 mm (W) * 368 mm(H) * 170 mm(D)
- Packed unit dimension: 495 mm(W) * 418 mm(H) * 142 mm(D) for WW
: 522mm(W) * 440mm(H) * 142mm(D) for China
- Net weight : 4.2Kg (Including I/F cable ? g)
- Gross weight : 5.1Kg for WW
: 5.3 Kg for China

4.17 Transportation

Transportation standards refer to UAN-D1534/00/01/02.

4.17.1 Transportation packages

- Net weight Packaging and wrapping shall be sufficient to protect the product against damage or loss during shipment from the supplier to the destination specified in the purchase order. All packaging materials are subject to test and evaluation per UAN-D1534/00/01/02.
- The cushion material shall be constructed using EPS material.
- The doggy hole is requested.

4.17.2 Transportation Test

- The overall test refer to UAN-D1534/00/01/02.
- Vibration, drop test should be performed at ambient temperature(20°C to 23°C) and relative humidity (40% to 65%).

A. Transportation test specification for all regions except China/India

- Package test
 1. Random Vibration test
 2. Drop test
 3. Cold Drop test (for design reference)
- Un-package test
 1. Half sine shock test (non operation)

General Product Specification

B. Transportation test specification for China/India

- Package test
 1. Random Vibration test
 2. Drop test
 3. Cold Drop test (for design reference)
- Un-package test
 1. Sine vibration (operating)
 2. Half sine shock test (non operation)

4.18 Pallet / Container loading

Transportation standards refer to TYE-M0002 ,UAN-D1534 and UAW-0309.

- Air shipment -
- Sea container 20'(pallet/slip sheet)
- Sea container 40'(pallet/slip sheet)
- Sea container 40' High Cube (pallet/slip sheet)
- Land 45' Truck and Trailer (800X1200mm pallet)
- Land 45' Truck and Trailer (1000X1200mm pallet) for UK
- Truck shipment-

Transportation request for all regions except China/India

A. Air shipment

B. 20'/40'/40'HQ Container loading for WW

Transportation request for China and India

A. Container loading for China and India

B. Truck loading

Transportation request for EU

A. Land 45' Truck and Trailer (800X1200mm pallet)

B. Land 45' Truck and Trailer (1000X1200mm pallet) for UK

General Product Specification

5 Environmental characteristics

The following sections define the interference and susceptibility condition limits that might occur between external environment and the display device.

5.1 Susceptibility of display to external environment

Operating

- Temperature : 0 to 40 degree C
- Humidity : 80% max
- Altitude : 0-3658m
- Air pressure : 600-1100 mBAR

Storage

- Temperature : -20 to 60 degree C
- Humidity : 95% max
- Altitude : 0-12192m
- Air pressure : 300-1100 mBAR

Note: recommend at 5 to 35°C, Humidity less than 60 %

5.2 Transportation tests

Refer to 5.15.2

5.3 Display disturbances from external environment

According to IEC 801-2 for ESD disturbances

5.4 Display disturbances to external environment

6 Reliability

6.1 Mean Time Between Failures

System MTBF (Including the LCD panel and CCFL) : 50,000 hrs

7 Quality assurance requirements

7.1 Acceptance test

According to MIL-STD-105D Control II level

AQL: 0.4 (major)

1.5 (minor)

(Please also refer to annual quality agreement)

Customer acceptance criteria: UAW0377/00

General Product Specification

8 Philips' Flat Panel Monitors Pixel Defect Policy

Philips' Flat Panel Monitors Pixel Defect Policy

BRIGHT DOT DEFECTS	ACCEPTABLE LEVEL		
<i>MODEL</i>	190C1		
1 lit sub-pixel	3		
2 adjacent lit sub-pixels	1		
3 adjacent lit sub-pixels (one white pixel)	0		
Distance between two bright dot defects*	$\geq 25\text{mm}$		
Bright dot defects within 20 mm circle	0		
Total bright dot defects of all type	3		

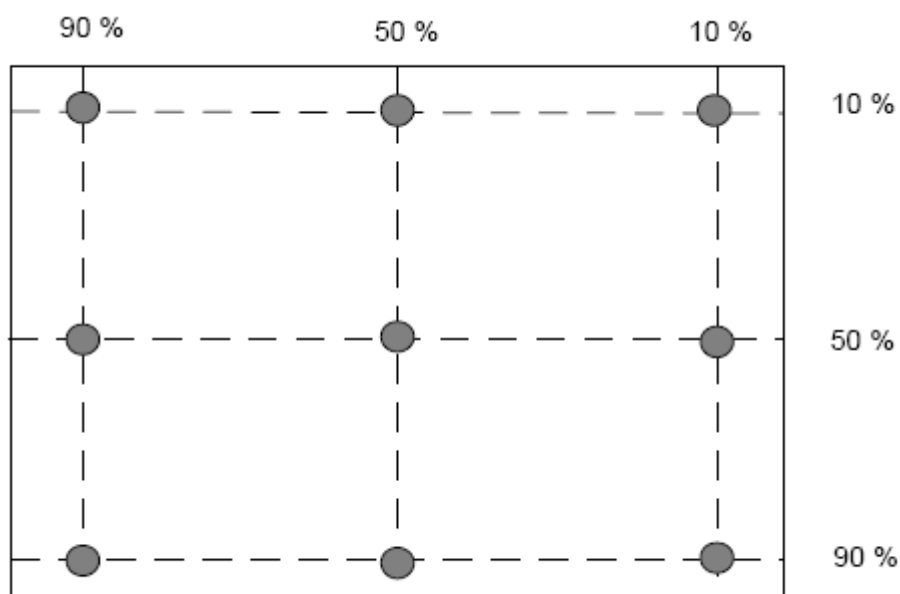
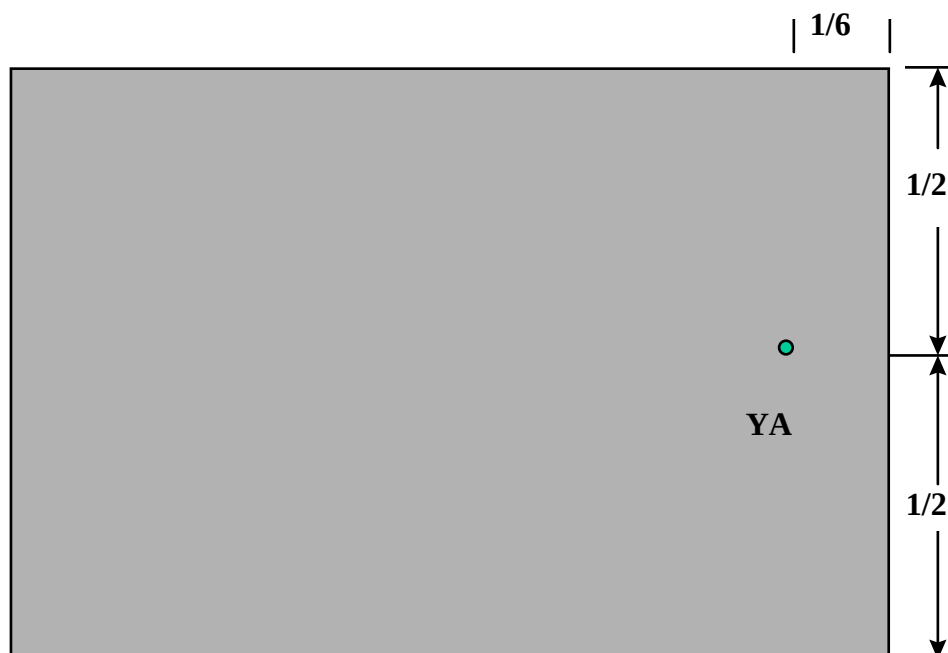
BLACK DOT DEFECTS	ACCEPTABLE LEVEL		
<i>MODEL</i>	190C1		
1 dark sub-pixel	5		
2 adjacent dark sub-pixels	2		
3 adjacent dark sub-pixels (one white pixel)	0		
Distance between two black dot defects*	$\geq 15\text{mm}$		
Black dot defects within 20 mm circle*	1		
Total black dot defects of all type	5		

TOTAL DOT DEFECTS	ACCEPTABLE LEVEL		
<i>MODEL</i>	190C1		
Total bright or black dot defects of all type	5		

* 1 or 2 adjacent sub-pixel defects = 1 dot defect

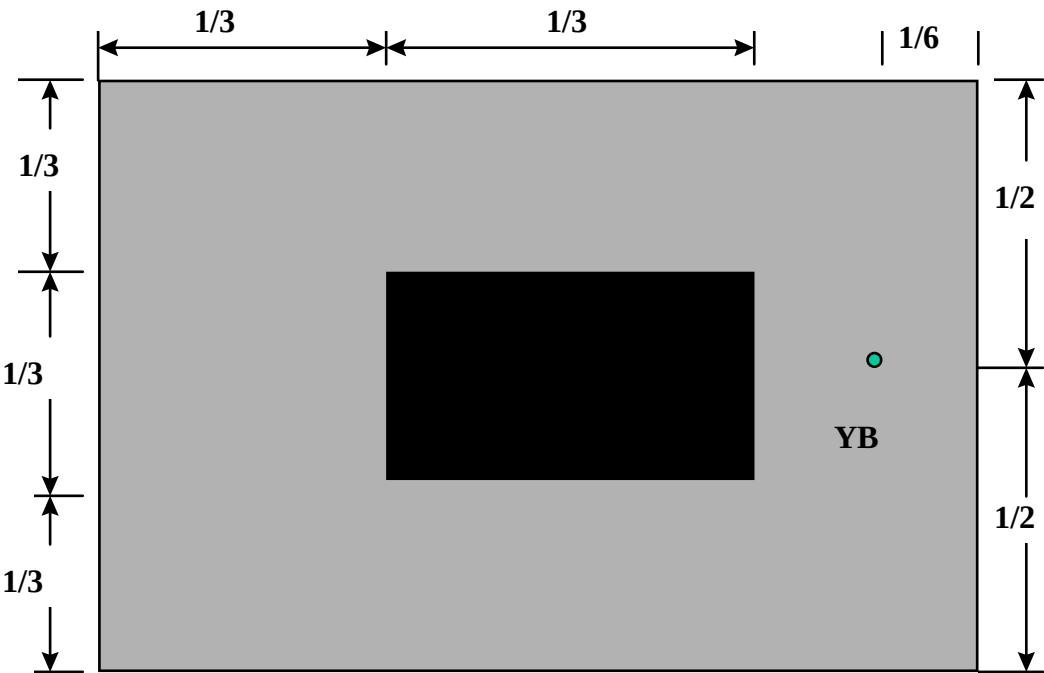
General Product Specification

Fig 1: Measurement locations of Brightness Uniformity

Fig 2: Cross talk pattern
Gray level 46 (64 Gray level)

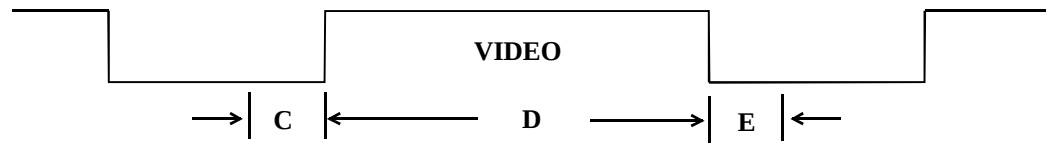
General Product Specification

Fig 3: Cross talk Pattern
Center at Gray level 0 (Black)

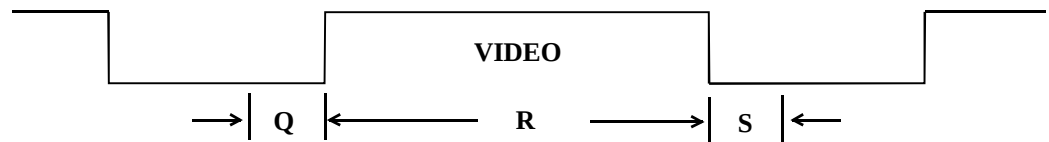
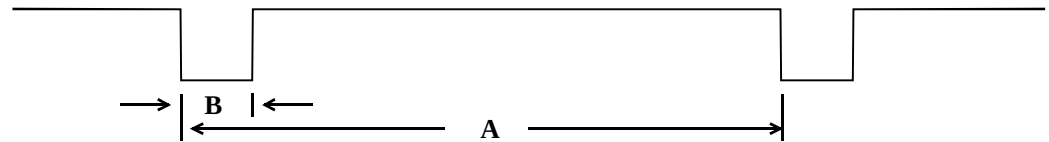


General Product Specification

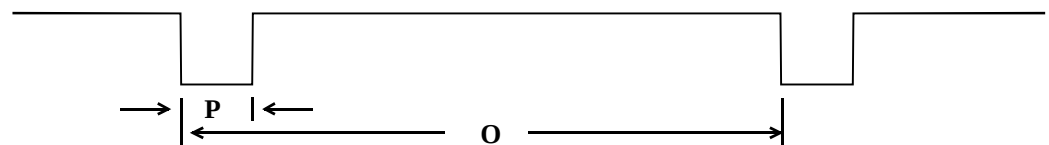
SEPARATE SYNC.



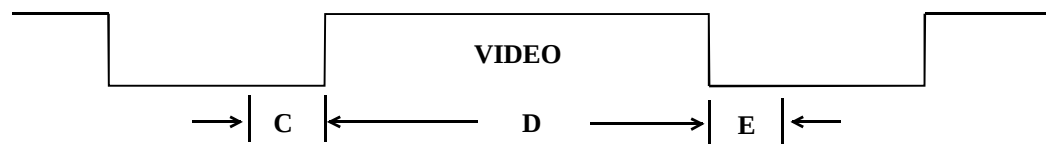
HORIZONTAL



VERTICAL



COMPOSITE SYNC.



HORIZONTAL

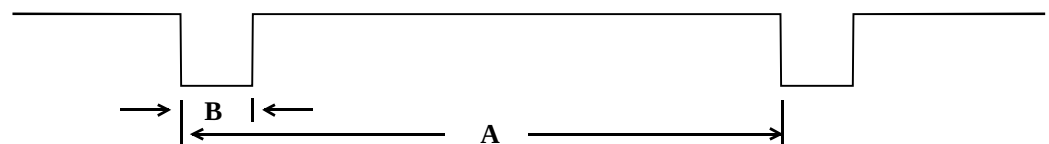


FIG-4 TIMING CHART -1

General Product Specification

9 REGULATORY COMPLIANCE

9.1 Worldwide Regulatory



TYE-A0004
20090325.xls

9.2 EMC Requirements

Supplier DVT EMI test result must be submitted prior to DVT samples delivery, and PVT EMI test result must be submitted again prior to PVT samples delivery. Which also has to meet Philips' immunity testing specification.

9.3 RoHS

Restriction on the use of certain hazardous substances.

Lead, Cadmium, Mercury, Hexavalent Chromium, Polybrominated Biphenyl (PBB) and Polybrominated Biphenyl Ether (PBDE)(flame retardant).

9.4 WEEE

Producer (Philips) responsible for retailer take back schemes and recycling.

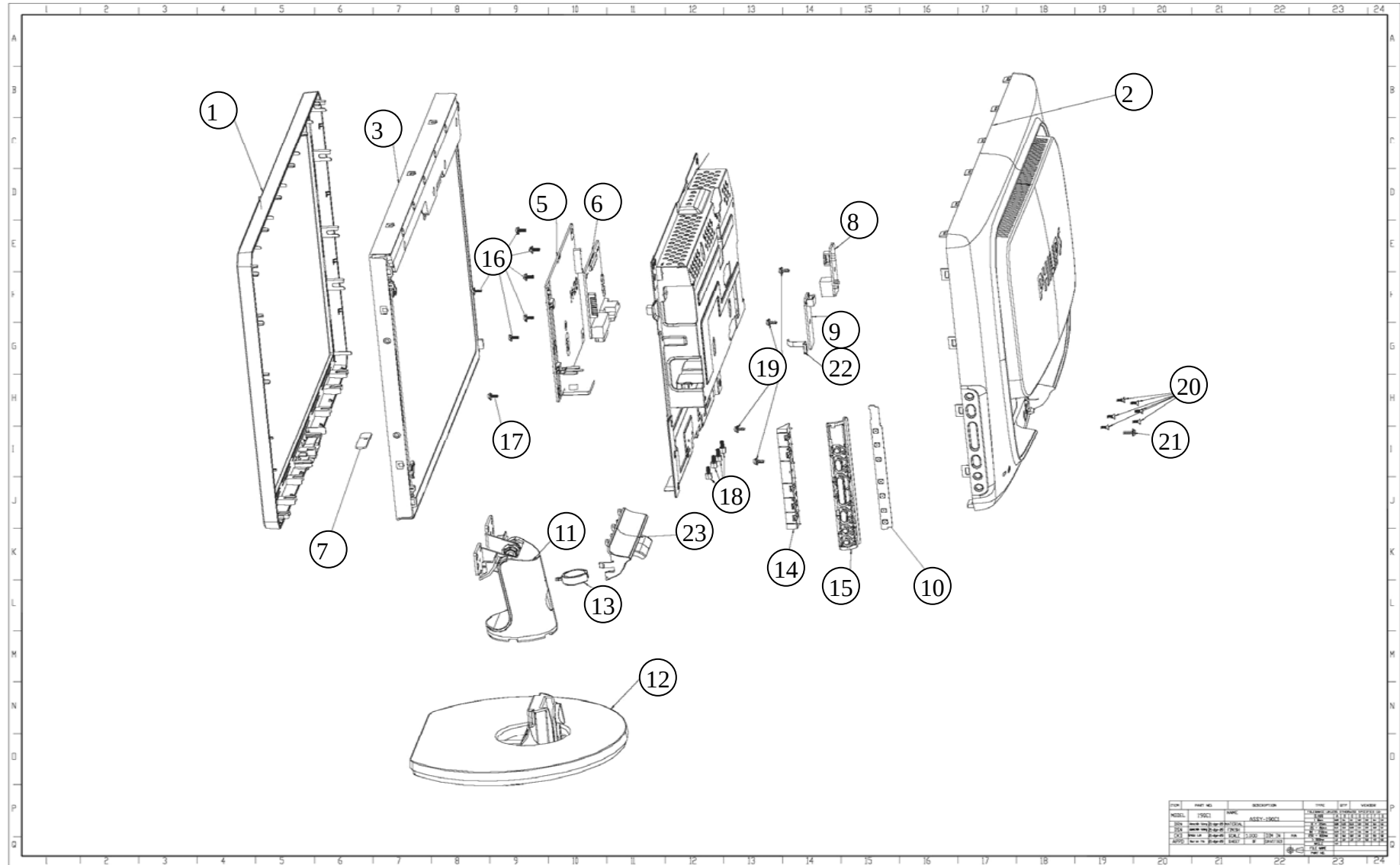
--System implemented.

--Collection and recycle targets.

9.5 Ongoing Regulatory

There's a possibility that other regulatory certificates will be required during the life of the product. It is the responsibility of the supplier to provide related documentation.

Exploded View



Spare / Recommended Parts List

Model:190C1

◎ Spare parts change rule:

Gray color: old parts can be ALT to new parts

Gray color with delete line: old parts can not be used to this model

◎ Spare parts upgrade rule: last number +1 --> Latest version parts number

Example

old : 6K.0QC01.011

new : 6K.0QC01.012

Panel+PCBA Styling		Model			
location	Description	PCM code	Philips 12NC	SEC	SEC
6	MAIN (I/F) BOARD ASS'Y	5E.0V101.021		V	V
5	POWER BOARD ASS'Y	5E.0V202.001		V	V
10	ASSY CTRL BD+FFC CABLE	6K.0KJ07.001	996510018330	V	V
7	LED BD	5E.0V126.001		V	V
3	LCDM19W LTM190BT03 P (SEC)	5F.LS8PP.001		V	V
9	USB BD (OUT)	5E.0KJ08.001	996510018324	V	V
8	USB BD (IN)	5E.0KJ32.001	996510018325	V	V
25	FFC CABLE 30P	5K.0RT05.N01		V	V

Mechanical Styling		Model			
location	Description	PCM code	Philips 12NC	SEC	SEC
12	BASE ASS'Y(Black)	6E.0KJ03.002	996510020188	V	V
11	STAND ASS'Y	6E.0KJ02.001	996510018774	V	V
13	ASSY CLIP (Black)	6E.0KJ05.001		V	V
23	COVER HINGE TOP (Black)	4B.0KJ04.011		V	V
1	FRONT BEZEL ASS'Y (Black)	6K.0KJ01.041		V	V
2	REAR COVER ASS'Y	6K.0KJ02.001	996510018328	V	V

Packing Styling		Model			
location	Description	PCM code	Philips 12NC	SEC	SEC
100	CUSHION T EPS	4G.0KJ03.001	996510018333	V	V
		4G.0KJ01.001	996510018777		V
110	CUSHION M EPS	4G.0KJ04.001	996510018334	V	V
		4G.0KJ02.001	996510018778		V
120	CARTON	4D.0KJ02.031		V	V
		4D.0KJ01.021			V

Accessory Styling		Model			
location	Description	PCM code	Philips 12NC	SEC	SEC
200	QSG PHILIPS 190C1	4J.0V101.001		V	V
210	CD EDFU PHILIPS 190C1	5B.0V101.001		V	V
30	CORD H05VV-F 10A250V EUR 1.8M	2G.00921.001	996510007306	V	V
	CORD RVV 250V 1.8M BLK CHINA	2G.04245.001	996510006066		V
26	CABLE SIGNAL (D-SUB)	5K.L2H06.501	996510006065	V	V
27	DVI CABLE	5K.05407.511	996510020257	V	V

Critical components		Model			
Location	Description	PCM code	Philips 12NC	SEC	SEC
IC601	IC PWR SW TOP258PN DIP8C 7P	0D.00258.030		V	V
T601	XFORM 2.0MH EFD-25 IN2010B	1J.20329.011		V	V
T801	XFORM INV 250MH EEL-19 L1811A	1J.26049.161		V	V
VAR1	TVS 10D 470V TVR10471KFC3FW	2D.50009.031	996510007143	V	V
IC801	IC PWM CTRL OZ9933GN SON-16P	7A.09933.001		V	V
Q801	FET MOS SP8M3FD5TB NC 8P	8D.02790.037		V	V
Q802				V	V
U3	IC CTRL NT68670BMFG QFP 128P	7A.68670.A0E	996510018319	V	V
U1	IC EEPROM AT24C02BN-SH-T SON-8	7B.02402.C01	996510007137	V	V
U2				V	V
U4	IC EEPROM AT24C16BN-SH-T SON-8	7B.02416.N01	996510007136	V	V
U7	IC FLASH PM25LV010A-100SCE SON	7B.25010.C01	996510018321	V	V
U6	FET MOS APM2305BAC-TRL PC 3P	8D.02305.031		V	V

Panel & PCBA photos

ITEM	PCM	Philips 12NC	Description	Photo
1	5F.LS8PP.001		LCDM19W LTM190BT03 P (SEC)	
2	5E.0V101.021		MAIN (I/F) BOARD ASS'Y	
3	5E.0V202.001		POWER BOARD ASS'Y	
4	6K.0KJ07.001	996510018330	ASSY CTRL BD+FFC CABLE	
5	5E.0V226.001		LED BD	
6	5E.0KJ08.001	996510018324	USB BD	
7	5E.0KJ32.001	996510018325	USB BD	

Repair Tips

0. Warning

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the unit via a wrist wrap with resistance. Keep components and tools also at the same potential!

1. Servicing of SMDs (Surface Mounted Devices)

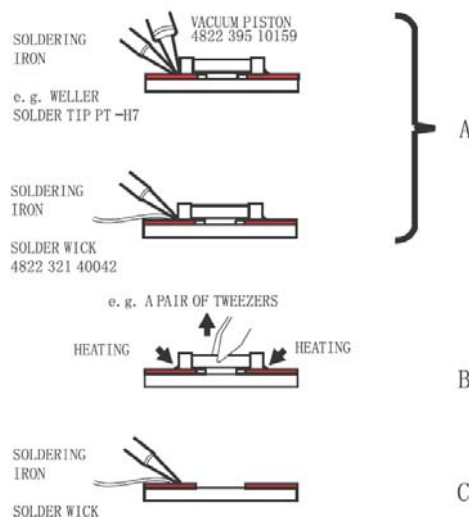
1.1 General cautions on handling and storage

- Oxidation on the terminals of SMDs results in poor soldering. Do not handle SMDs with bare hands.
 - Avoid using storage places that are sensitive to oxidation such as places with sulphur or chlorine gas, direct sunlight, high temperatures or a high degree of humidity. The capacitance or resistance value of the SMDs may be affected by this.
 - Rough handling of circuit boards containing SMDs may cause damage to the components as well as the circuit boards. Circuit boards containing SMDs should never be bent or flexed. Different circuit board materials expand and contract at different rates when heated or cooled and the components and/or solder connections may be damaged due to the stress. Never rub or scrape chip components as this may cause the value of the component to change.
- Similarly, do not slide the circuit board across any surface.

1.2 Removal of SMDs

- Heat the solder (for 2-3 seconds) at each terminal of the chip. By means of litz wire and a slight horizontal force, small components can be removed with the soldering iron.
- They can also be removed with a solder sucker (see Fig. 1A)

Fig. 1 DISMOUNTING



While holding the SMD with a pair of tweezers, take it off gently using the soldering iron's heat applied to each terminal (see Fig. 1 B).
 - Remove the excess solder on the solder lands by means of litz wire or a solder sucker (see Fig. 1C).

While holding the SMD with a pair of tweezers, take it off gently using the soldering iron's heat applied to each terminal (see Fig. 1 B).
 - Remove the excess solder on the solder lands by means of litz wire or a solder sucker (see Fig. 1C).

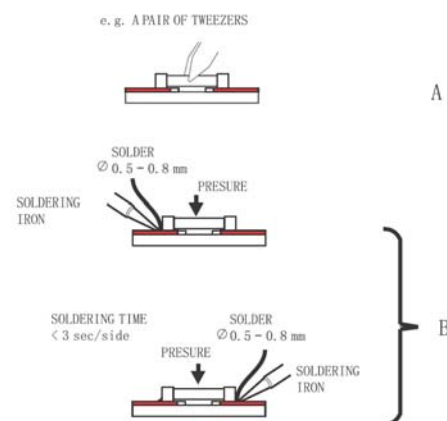
1.3 Caution on removal

- When handling the soldering iron, use suitable pressure and be careful.
- When removing the chip, do not use undue force with the pair of tweezers.
- The soldering iron to be used (approx. 30 W) should preferably be equipped with a thermal control (soldering temperature: 225 to 250 °C).
- The chip, once removed, must never be reused.

1.4 Attachment of SMDs

- Locate the SMD on the solder lands by means of tweezers and solder the component on one side. Ensure that the component is positioned correctly on the solder lands (see Fig. 2A).
- Next complete the soldering of the terminals of the component (see Fig. 2B).

Fig. 2 MOUNTING

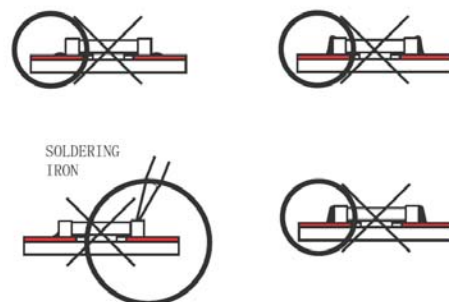


2. Caution when attaching SMDs

- When soldering the SMD terminals, do not touch them directly with the soldering iron. The soldering should be done as quickly as possible, care must be taken to avoid damage to the terminals of the SMDs themselves.
- Keep the SMD's body in contact with the printed board when soldering.
- The soldering iron to be used (approx. 30 W) should preferably be equipped with a thermal control (soldering temperature: 225 to 250 °C).
- Soldering should not be done outside the solder land.
- Soldering flux (of rosin) may be used, but should not be acidic.
- After soldering, let the SMD cool down gradually at room temperature.
- The quantity of solder must be proportional to the size of the solder land. If the quantity is too great, the SMD might crack or the solder lands might be torn loose from the printed board (see Fig. 3).



Fig.3 Examples



Repair Tips

3. Lead-free product identification

You can identify lead-free product by Philips-lead-free logo on PCB.



4. Lead-free product repair instruction

4.1 Use only lead-free Solder Alloy 0622 149 00106(1.2mm SAC305) or 0622 14900108(1.0mm SAC305).

Remark: For lead free soldering material, please visit www.alphametals.com website for details. This is recommended by Philips.

4.2 Use only adequate solder tools applicable for lead-free soldering-tin. The solder tool must be able to reach at least a solder-temperature of 400, to stabilize the adjusted temperature at the solder-tip and to exchange solder-tips for different applications.

Small Passives/Actives to be removed with thermal tweezers

Automated system for IC and BGA repair (Microscope, Camera, Beam split optics, Computer, Programmer, Heat controllers, Vacuum system, Laser pointer) Solder Hand-Tool (Adjustable in temperature height, Temperature shall be held constant, Flexible tips)

4.3 Adjust your solder tool so that a temperature around 360 -380 is reached and stabilized at the solder joint.

Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400 otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. Corrosion of Tool-Spikes can be avoided when using SAC305 and a temperature of less than 400.

4.4 Mix of lead-free solder-tin/parts with leaded soldering-tin/parts is possible but not recommended. If not to avoid clean carefully the solder-joint from old tin and re-solder with new tin.

4.5 Use only original spare-parts listed in the Service-Manuals. Standard-material (consumables) can also be purchased at external companies.

4.6 Special information for lead-free BGA-ICs: this ICs will be delivered in so-called dry-packaging to protect the IC against moisture and with lead-free logo on it. This packaging may only be opened shortly before it is used (soldered). Otherwise the body of the IC gets wet inside and during the heating time the structure of the IC will be destroyed due to high (steam-) pressure. If the packaging was opened before usage the IC has to be heated up for some hours (around 90) for drying (Take attention for ESD-protection!)

5. Rework on BGA (Ball Grid Array) ICs

General

Although (LF)BGA assembly yields are very high, there may still be a requirement for component rework. By rework, we mean the process of removing the component from the PWB and replacing it with a new component. If an (LF) BGA is removed from a PWB, the solder balls of the component are deformed drastically so the removed (LF)BGA has to be discarded.

Device Removal

As is the case with any component that, it is essential when removing an (LF) BGA, the board, tracks, solder lands, or surrounding components are not damaged. To remove an (LF)BGA, the board must be uniformly heated to a temperature close to the reflow soldering temperature. A uniform temperature reduces the chance of warping the PWB.

To do this, we recommend that the board is heated until it is certain that all the joints are molten. Then carefully pull the component off the board with a vacuum nozzle. For the appropriate temperature profiles, see the IC data sheet.

Area Preparation

When the component has been removed, the vacant IC area must be cleaned before replacing the (LF) BGA. Removing an IC often leaves varying amounts of solder on the mounting lands. This excessive solder can be removed with either a solder sucker or solder wick. The remaining flux can be removed with a brush and cleaning agent. After the board is properly cleaned and inspected, apply flux on the solder lands and on the connection balls of the (LF)BGA

Note: Do not apply solder paste, as this has shown to result in problems during re-soldering.

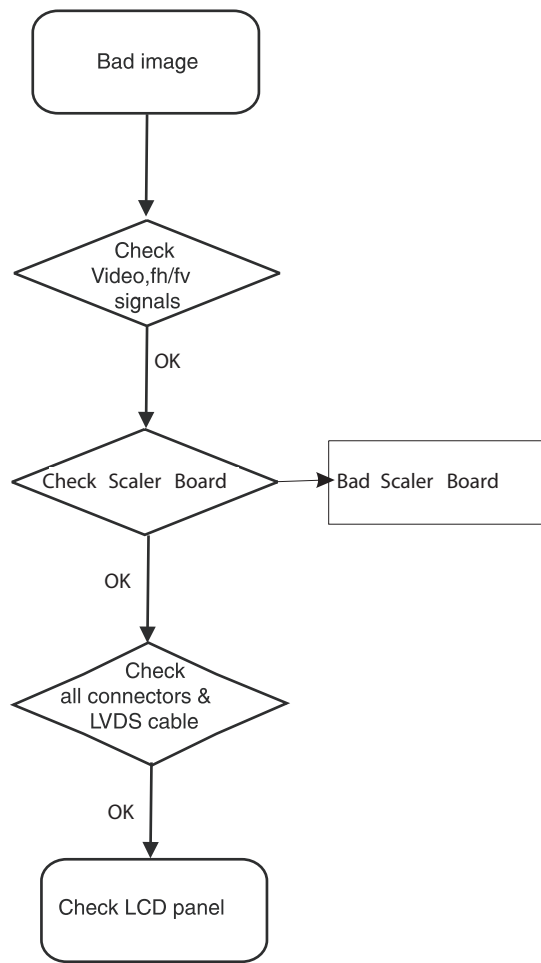
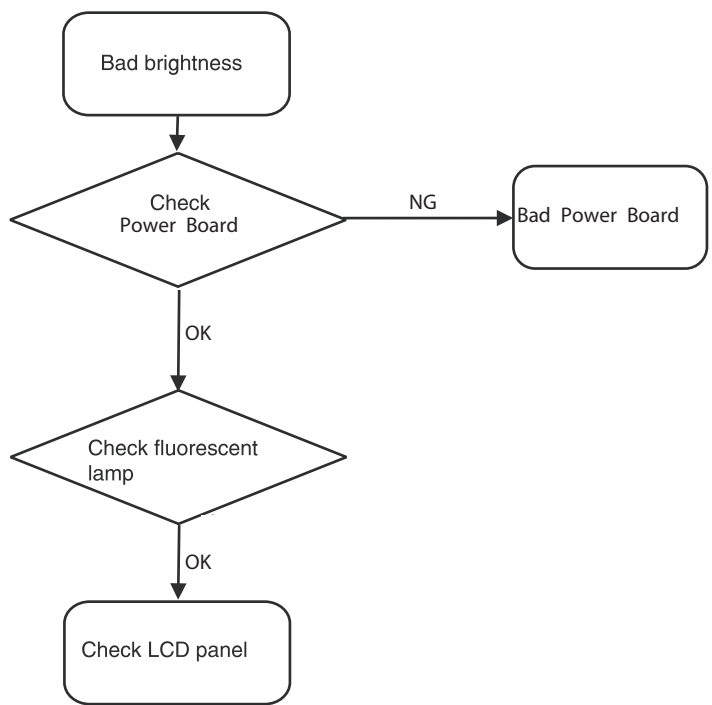
Device Replacement

The last step in the repair process is to solder the new component on the board. Ideally, the (LF) BGA should be aligned under a microscope or magnifying glass. If this is not possible, try to align the (LF)BGA with any board markers. To reflow the solder, apply a temperature profile according to the IC data sheet. So as not to damage neighbouring components, it may be necessary to reduce some temperatures and times.

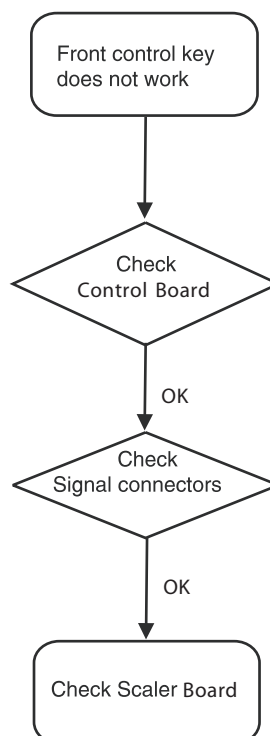
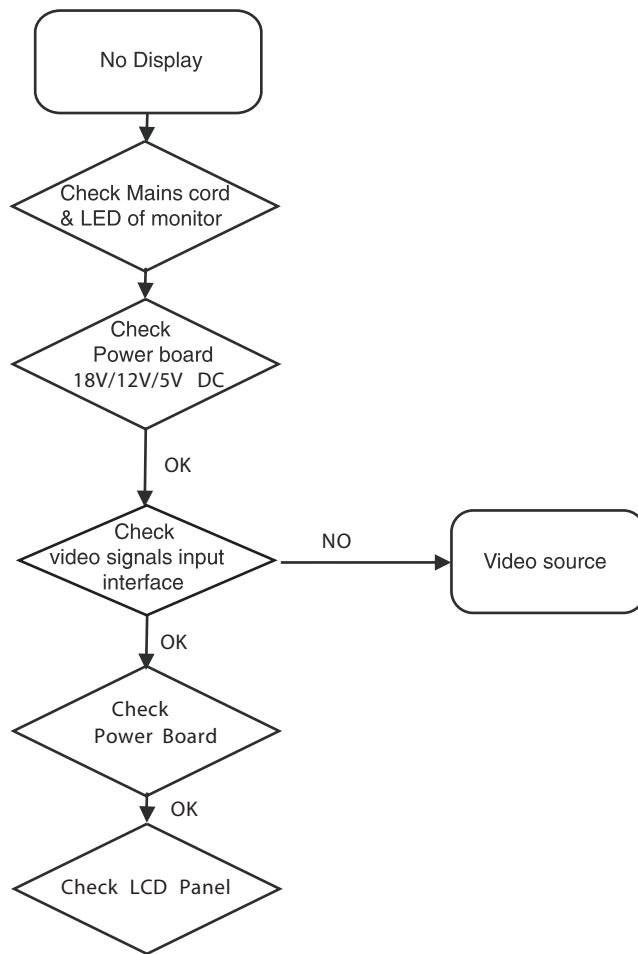
More Information

For more information on how to handle BGA devices, visit this URL: <http://www.atyourservice.ce.philips.com> (needs subscription). After login, select Magazine, then go to Workshop Information. Here you will find Information on how to deal with BGA-ICs.

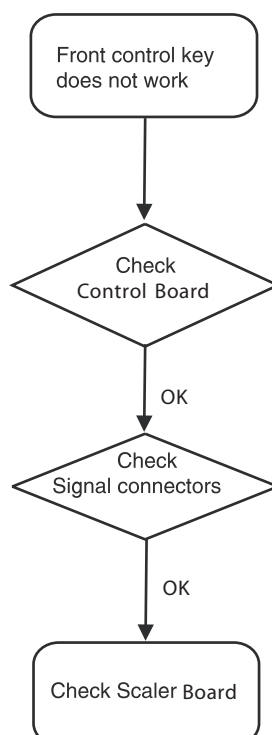
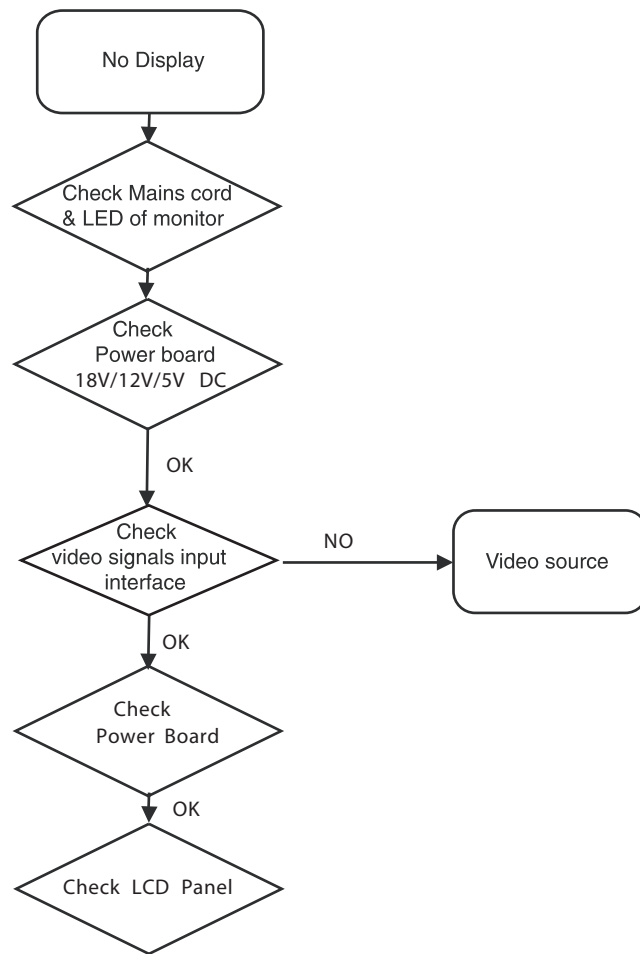
Repair Flow Chart



Repair Flow Chart



Repair Flow Chart



Safety Test Requirements

All units that are returned for service or repair must pass the original manufactures safety tests. Safety testing requires both Hipot and Ground Continuity testing.

HI-POT TEST INSTRUCTION

1. Application requirements

1.1 All mains operated products must pass the Hi-Pot test as described in this instruction.

1.2 This test must be performed again after the covers have been refitted following the repair , inspection or modification of the product.

2. Test method

2.1 Connecting conditions

2.1.1 The test specified must be applied between the parallel blade plug of the main scord and all accessible metal parts of the product.

2.1.2 Before carrying out the test, reliable conductive connections must be ensured and thereafter be maintained throughout the test period.

2.1.3 The mains switch(es) must be in the "ON" position.

2.2 Test Requirements

All products should be HiPot and Ground Continuity tested as follows:

Condition	Hi-Pot Test for products where the mains input is 220V AC	Hi-Pot Test for products where the mains input is 110V AC	Ground Continuity Test requirement
Test voltage	2820VDC (2000VAC)	1700VDC (1200VAC)	Test current: 25A, AC Test time: 3 seconds
Test time	3 seconds	1 seconds	Resistance required: $\leq 0.09 + R_{ohm}$, R is the resistance of the mains cord.
Trip current (Tester)	Set at 100uA for Max limit; Set at 0.1uA for Min limit.	5mA	91 220CW9 LCD
Ramp time (Tester)	Set at 2 seconds		

2.2.1 The minimum test duration for Quality Control Inspector must be 1 minute.

2.2.2 The test voltage must be maintained within the specified voltage + 5%.

2.2.3 There must be no breakdown during the test.

2.2.4 The grounding blade or pin of mains plug must be conducted with accessible metal parts.

3. Equipments and Connection

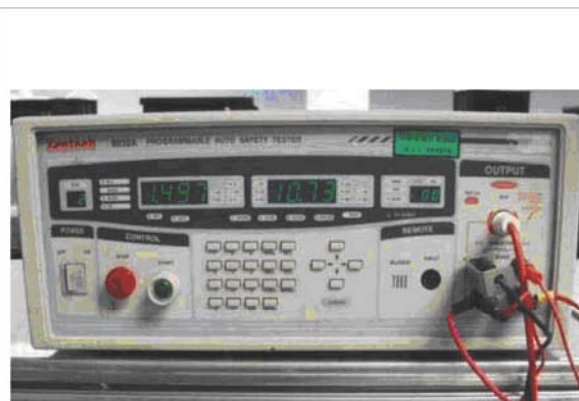
3.1. Equipments

For example :

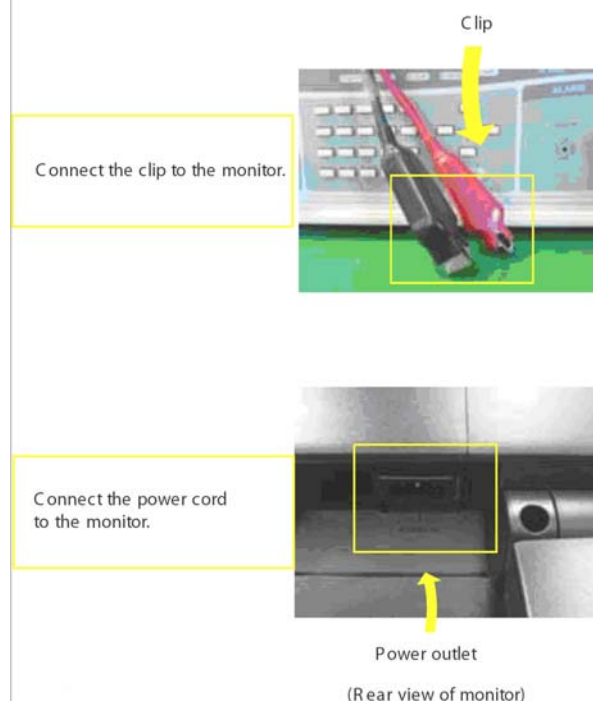
- Zentech 9032 PROGRAMMABLE AUTO SAFETY TESTER

3.2. Connection

* Turn on the power switch of monitor before Hipot and Ground Continuity testing.



(Zentech 9032 tester)



4. Recording

Hipot and Ground Continuity testing records have to be kept for a period of 10 years.